Wawa District

Fisheries Management Plan:

1989 - 2000

Ontario

Ministry of
Natural
Resources

Vincent G. Kerrio
Minister

Ontario

Ministry of Natural Resources

Ministère des Richesses naturelles

P.O. Box 1160
Wawa, Ontario
P0S 1K0

705-856-2396

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To Whom it May Concern:

As requested, a copy of the Wawa District Fisheries is attached.

Yours sincerely,

R. E Jerrard

for B.R. Pfrimmer
Fish and Wildlife Supervisor
Wawa District

MP/kt

Attachment

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Vincent G. Kerrio
Minister

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Ministry of Natural Resources
Wawa District Office
P.O. Box 1160
Wawa, Ontario
P0S 1K0
Telephone: (705) 856-2396

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PREFACE

The Wawa District Fisheries Management Plan is prepared under the general context of the Wawa District Land Use Guidelines, and outlines the long-term management (1989-2000) for both inland and Lake Superior fisheries within the Wawa District.

The purpose of the plan is to outline the background information on the District's fisheries, specify objectives for the fisheries, and identify management actions that will achieve those objectives.

Regional Director
Northeastern Region

District Manager
Wawa District

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1.0 INTRODUCTION

1.1 THE FISHERIES MANAGEMENT PLANNING PROCESS

The purpose of the fisheries management planning process is to ensure that our fisheries provide optimum benefits to the people of Ontario, and that our fisheries management is acceptable to the public, achieves the desired results, and makes the best use of limited funds.

Fisheries management in Ontario is done within the resource management planning system of the Ministry of Natural Resources (MNR). Provincial policies and strategic plans indicate the general direction for resource management in Ontario. The main direction for fisheries management in the Province is provided by the Strategic Planning for Ontario Fisheries (SPOF) reports. Additional direction is found in the Northeastern Region Strategic Land Use Plan (SLUP), the Lake Superior Strategic Fisheries Plan, and the Wawa District Land Use Guidelines (DLUG). These plans indicate general objectives, production targets, land and water requirements, and general management strategies for fisheries in the Wawa District.

The District Fisheries Management Plan (DFMP) is one of several resource management plans in the District, such as Timber Management Plans and Park Management Plans. These plans indicate in detail how a resource will be managed locally within the framework of the strategic plans mentioned above. Specifically, the DFMP refines the objectives and targets for fisheries management at the local level, details the problems and issues affecting the fishery, and proposes specific management actions to correct the problems. The DFMP identifies both long term fisheries management direction (to the year 2000) and a short term fisheries management program (6 year implementation schedule). The annual fisheries work program will be taken directly from the implementation schedule.

The first phase in the preparation of the DFMP was the Summary of the Background Information and Management Options. This document was released in February 1988 and identified a variety of ideas for fisheries management in the Wawa District. Comments from the public were solicited to determine which of these ideas were most favoured.

The Draft DFMP, released in August 1988, was the second phase in the preparation of the DFMP. It indicated the fisheries objectives and targets, and the fisheries management actions that seem to be most appropriate for the District based on public input. Consequently, some of the ideas from the Background Information and Management Options document were changed or dropped and some new ideas were added. The Draft Plan also included an implementation schedule which indicated in priority the fisheries management activities that will be attempted in the first 6 years of the plan. Public comments were also solicited on the Draft DFMP, and these comments were considered in the preparation of the final DFMP.

This document, the final DFMP, includes the actual objectives and targets to be achieved by the year 2000, the specific management actions that will be used, and the work planned for the first 6 years. This final plan will be revised every 5 years, or as necessary.

1.2 ABOUT THE PLAN

The DMFP is based on the Draft DFMP and the public comments received on that document. The public input was used to clarify some of the information presented, and change some of the fisheries management actions. Whereas the Draft Plan indicated the proposed management for the fisheries in the Wawa District, the final Plan indicates the actual management that will be attempted.

The Plan is organized in the following format:

1) Background Information - Summarizes the present information on the fisheries in the District. Includes descriptions of the fisheries resource, resource use, and present management. (what we have).

2) Objectives and Targets - Indicates the type and quality of fisheries we will aim for. (what we want).

3) Problems and Issues - Identifies the factors that are preventing the objectives and targets from being achieved. These factors are limiting the fishery now. (what must be changed).

4) Management Actions - Indicates management techniques that may be used to reduce the identified problems to achieve the objectives and targets. (what we can do).

This format is followed for the general section on fisheries management in the District and for the more specific sections on the different fisheries management zones within the District.

An implementation schedule for the management actions is also included in the Plan. This schedule lists the fisheries management actions for the first 6 years of the Plan. Activities on the schedule will be done in priority as time and funding are available.

In summary, the DFMP identifies objectives for the fisheries, the problems preventing attainment of the objectives, and management actions to reduce the problems. This objective and problem oriented approach helps ensure that our fisheries management is effective. Conducting management activities in order of priority helps achieve the most efficient use of available fisheries management time and funds. Incorporating public review into the procedure helps ensure that our fisheries management provides optimum benefits using the most acceptable techniques.

1.3 THE DIRECTION FOR FISHERIES MANAGEMENT IN ONTARIO

The fisheries management for Wawa District must coincide with Provincial policies and strategies. The general Provincial direction can be summarized as follows: fisheries management in Ontario is based on the general principles of sound fisheries science, type-lake assessment, sustainable yield harvest management, and natural reproduction of locally indigenous species. Management effectiveness and efficiency are a high priority. Benefits to Ontario residents will include a regionally or locally appropriate mix of food, recreation, employment, and income, and a high quality environment.

2.0 BACKGROUND INFORMATION

This section summarizes the document entitled Background Information for the Wawa District Fisheries Management Plan. The Background Information document is too large to reproduce here, but can be seen at the MNR District Office in Wawa by anyone wanting more detail.

2.1 RESOURCE BASE

2.1.1 PERSPECTIVE

The Wawa District is one of seven Administrative Districts in the Northeastern Administrative Region of the MNR (Figure 1). The Wawa District is located on the northeastern shore of Lake Superior, and is characterized by the rugged terrain of the Canadian Shield, vast expanses of Lake Superior, extensive boreal forest in the north, Great Lakes - St. Lawrence forest in the south, and numerous lakes and rivers in both the Atlantic and Arctic watersheds.

Wawa District has a modified continental climate characterized by short warm summers, long cold winters, and relatively high amounts of precipitation throughout the year. Considerable local variations in temperature, precipitation and wind are common because of the influences of Lake Superior and the rugged topography of the Canadian Shield. The frost free period in the District ranges between 133 and 172 days. Freeze-up on inland lakes occurs around mid-November and break-up occurs in late April or early May. Therefore, the time available for aquatic production and fish growth is short.

The bedrock geology of the District is dominated by the Precambrian Canadian Shield. About 70% of the District is metamorphosed plutonic rock of mainly granitic composition. About 30% of the District is greenstone, mainly metamorphosed volcanic and sedimentary rocks. Surficial geology is dominated by glacial deposits which are widespread in the northeast half of the District but less extensive in the rugged terrain near Lake Superior. Because the glacial deposits contain carbonate material, the waters in the northeast half of the District are well buffered against acid precipitation, and are moderately productive. The waters lying on granitic bedrock near Lake Superior are subject to acidification and low in productivity.

2.1.2 THE RESOURCE

Wawa District includes 2,253,000 hectares (ha) of land and inland water. The waters of Lake Superior represent 952,108 ha. Inland waters total 168,609 ha. There are about 12,250 lakes and ponds in the District. The waters within Pukaskwa National Park are managed by Parks Canada and are excluded from this plan. The estimated potential yield of all species of fish from the waters of Wawa District is about 1,155,000 kg, but only about 485,000 kg or 42% of this yield is in sportfish (Table 1). Potential yield represents the maximum annual harvest of fish which can be provided year after year by a self-sustaining population. Calculation of potential yield is based on the historic yields from Lake Superior and on a formula known as the morphoedaphic index (MEI) for inland waters. The MEI is based on the close relationship of nutrient level and lake depth to fish production, and is a good predictor of potential yield.

FIGURE 1

PROVINCIAL AND REGIONAL SETTING OF WAWA DISTRICT

Wawa District

District Administrative Boundary

Northeastern Region Administrative Boundary

Provincial Boundary

International Boundary

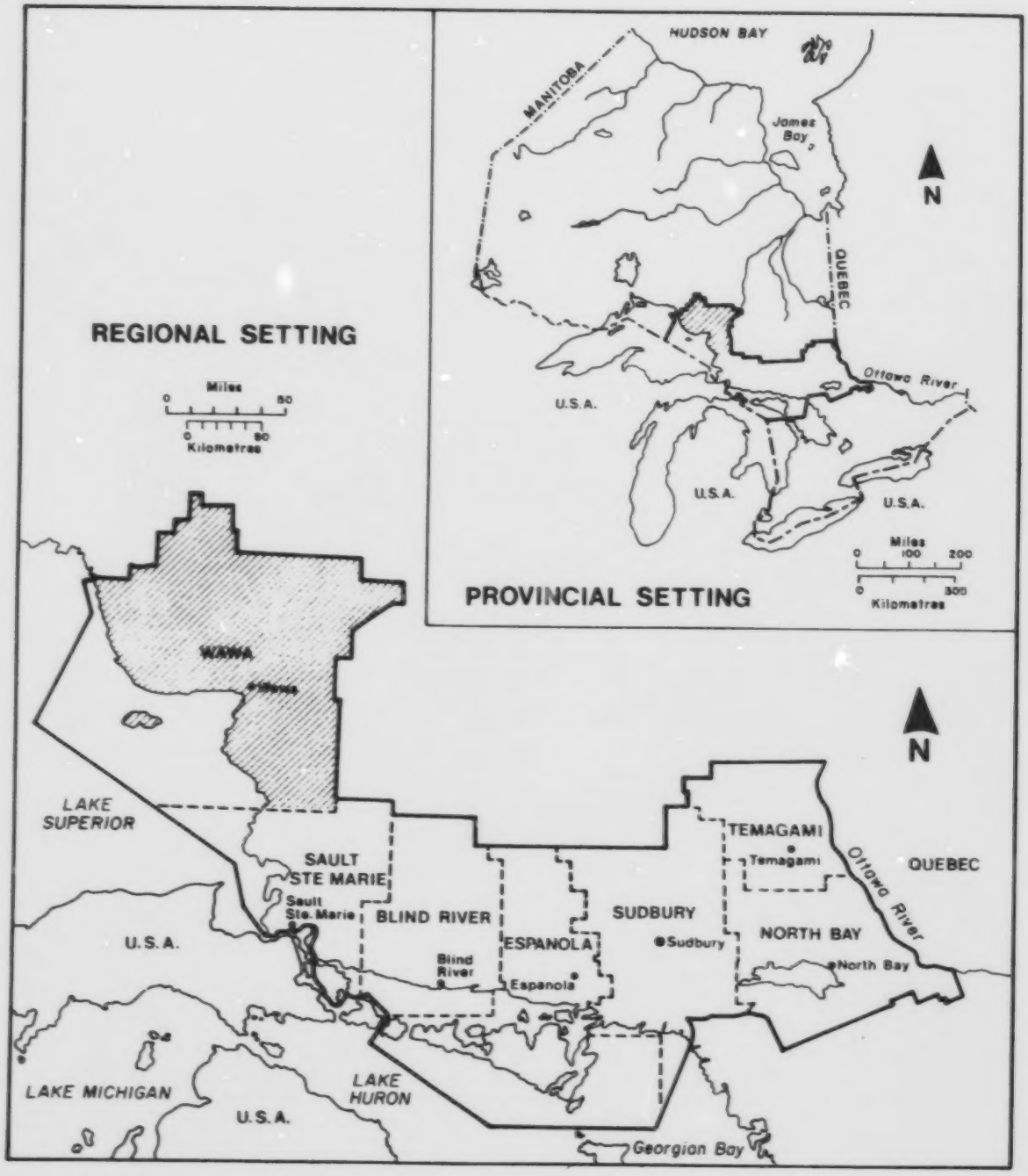


TABLE 1. SURFACE WATER AREA AND ESTIMATED POTENTIAL FISH YIELDS FOR MNR DISTRICT WATERS.

WATER	NUMBER	TOTAL AREA (ha)	ESTIMATED POTENTIAL YIELD ALL SPECIES (kg/yr)	SPORTFISH (kg/yr)
KNOWN INLAND LAKES				
Coldwater	307	30,651.5	114,614.1	47,208.0
Coolwater	257	52,687.0	267,500.8	152,637.7
RIVERS AND STREAMS				
Coldwater	63	3,399.5	16,997.5	6,803.2
Coolwater	37	5,234.8	33,163.2	18,995.1
UNKNOWN WATERS	-	76,635.8	358,236.6	89,559.2
TOTAL INLAND WATERS		168,608.6	790,512.2	315,203.2
LAKE SUPERIOR		952,108.0	364,091.0	170,000.0
TOTAL ALL WATERS		1,120,716.6	1,154,603.2	485,203.2

coldwater = trout and salmon communities.

coolwater = walleye, northern pike, yellow perch, smallmouth bass communities.

unknown waters = unsurveyed waters with production estimated using average production from known waters.

Coolwater lakes and rivers comprise 63% of the District's inland water area. The majority of these waterbodies contain some combination of walleye, northern pike, yellow perch, lake whitefish, and common white suckers. White Lake is the largest coolwater lake at 5,892.9 ha. Walleye have been documented in 174 lakes, but are known to occur in many other waters. Coldwater lakes and streams comprise 37% of the District's inland water area. They include both naturally producing coldwater fisheries and waterbodies capable of supporting a coldwater fishery if stocked. Coldwater fish species include lake trout, brook trout, rainbow trout, and splake - collectively called salmonids. Dog Lake is the largest coldwater lake at 5,182.8 ha. Lake trout inhabit 69 lakes averaging 350 ha in size. Brook trout have been documented in 229 lakes averaging 30.0 ha in size, but are known to occur in many other small lakes. The estimated potential yield of sportfish species from the inland waters of the District is about 315,000 kg. Walleye provide about 35% of this total and salmonids about 9% (Table 2). A large portion of the potential yield is in less sought after species such as pike and whitefish. Because of our boreal climate and Canadian Shield geology, fish production is low. Lake trout production is about 0.5 kg/ha/yr and walleye about 1.5 kg/ha/yr.

The large number of lakes in the area has made Wawa District an important area for fisheries based tourism. The waters in the District are also very important to local residents for recreation. Consequently, there is a large demand for fish. However, the quality of fishing on many waters in the District appears to be declining, with anglers often commenting on poorer catch rates and smaller sized fish. In most areas, the reduction in angling quality can be attributed to the harvest of fish exceeding the relatively low productivity of the water. Fish are simply being taken out faster than they can grow to the desired size, so numbers and size of fish decline. In some areas, habitat is the main problem, particularly acid precipitation and water level fluctuations for hydro power production. In other areas, disruptions of the fish community are the main problem, for example, perch introductions to brook trout lakes.

Lake Superior makes up 85% of the water area in the Wawa District. Fish native to the lake include lake trout, brook trout, lake whitefish, burbot, chub, lake herring, sturgeon, deepwater sculpins, and white suckers. Fish introduced to the lake include: pink salmon, chinook salmon, coho salmon, rainbow trout, brown trout, alewife, rainbow smelt, and sea lamprey. The estimated potential yield from Lake Superior is about 364,100 kg. Of this, about 65,000 kg of trout and salmon is available for sportfishing (Table 3). This is 18% of the total yield or 38% of the top predator component. The remainder is available for commercial fishing.

Commercial overfishing and the invasion of the sea lamprey have been major factors in the reduction of the stocks of lake trout and other species in Lake Superior. Competition from invading smelt and alewife may have contributed to declines in herring and chub. Lake trout stocks seem to be recovering following intensive lamprey control, restrictions on commercial fishing, and massive stocking. The commercial fishery still dominates the harvest from Lake Superior, targeting on lake trout, but also taking whitefish, chub, herring, and smelt. A high quality sportfishery for chinook salmon, lake trout, and rainbow trout is also developing on the lake.

TABLE 2. ESTIMATED POTENTIAL YIELD OF SPORTFISH SPECIES FROM THE INLAND WATERS OF WAWA DISTRICT.

SPECIES	NUMBER (includes rivers and streams)	TOTAL AREA (ha)	ESTIMATED POTENTIAL YIELD (kg/yr) KNOWN WATERS	KNOWN+UNKNOWN* WATERS
LAKE TROUT	69	22,679.0	12,733.7	12,733.7
BROOK TROUT	277	11,873.8	10,399.1	14,040.8
RAINBOW TROUT	47	3,161.4	1,334.1	1,648.1
SPLAKE	6	124.6	183.0	183.0
COHO SALMON	12	213.8	187.1	266.8
NORTHERN PIKE	231	68,231.3	66,861.5	95,337.8
WALLEYE	174	63,058.4	76,931.6	109,696.8
LAKE WHITEFISH	110	55,616.9	47,052.0	67,091.5
YELLOW PERCH	12	17,714.2	8,079.5	11,520.6
SMALLMOUTH BASS	5	5,981.6	1,882.4	2,684.1
TOTAL			225,644.0	315,203.2

* All lake trout and splake lakes are assumed known, other species are assumed to exist in known and unknown waters in the same proportion. Chinook salmon yield is included under Lake Superior.

TABLE 3. TARGET TESTING FOR WAWA DISTRICT

	CURRENT USE[1]		PROTECTED USE[3]		RESOURCE CAPABILITY[4]		TARGET[5]	
	angler-days	harvest	angler-days	harvest	angler-days	harvest	angler-days	harvest
A. SPORT FISHERY								
INLAND								
Walleye	80,000	50,000	92,000	92,000	175,360	109,700	92,000	92,000
Trout	60,000	20,000	69,000	34,500	86,700	28,900	69,000	34,500
Northern Pike	40,000	40,000	46,000	46,000	95,300	95,300	46,000	46,000
Other	10,000	5,000	11,500	5,750	163,000	81,300	11,500	5,750
SUBTOTAL	190,000	115,000	218,500	178,250	520,360	315,200	218,500	178,250
LAKE SUPERIOR								
Top Predators	10,000	26,000	25,000	65,000	25,000	65,000	25,000	65,000[7]
Lake Trout		8,000		20,000		50,000		50,000
Other		18,000		45,000		15,000		15,000
TOTAL	200,000	141,000	243,500	243,250	545,360	370,200	243,500	243,250
B. COMMERCIAL FISHERY								
Food	32 lic.	207,475[8]	408,000	-----	Total	299,091[6]	Total	299,091[7]
Lake Trout		101,513				105,000		105,000[8]
Lake Whitefish		39,654						
Lake Herring		28,768	105,962			194,091		194,091
Chubs		37,540						
Bait	36 lic.	25,000 doz.	---	28,750 doz.		-----		28,750 doz.

1. Current use is based on District creel surveys and provincial angler survey.
2. One angler-day equals four hours of fishing.
3. The projected use (to the year 2000) is based on a 15% increase in pressure for inland waters, a 250% increase in pressure for Lake Superior, and 50% increase in harvest rate (demand) for walleye and inland trout.
4. The resource capability is the estimated potential yield of the resource (ie. sustainable yield) at present harvest rates.
5. The targets are the projected use for angling and allocated quota for commercial fishing. Where target exceeds resource capability, an attempt will be made to increase projection by creating new populations with introductions.
6. The target for the Lake Superior sport fishery was determined in the Lake Superior Strategic Fisheries Plan (1986-2000).
7. The current use of the commercial fishery is based on 1985 harvest estimates.
8. The target for lake trout in the commercial fishery was determined in the Lake Superior Strategic Fisheries Plan (1986-2000).

A number of significant fisheries occur in the Wawa District. Lake Superior is significant because it is the largest lake in the world and the largest lake trout ecosystem in the world. Michipicoten Bay on Lake Superior is notable because it provides one of the highest quality chinook salmon and lake trout fisheries on the Great Lakes. All of the other lake trout lakes in the District are also considered significant because of their fragile nature. The lake trout sanctuary lakes of Mishibishu, Mishi, Katzenback and Augusta are of special interest because they contain original lake trout stocks from Lake Superior, including the river spawning stock from the Dog (University) River. The District also has two of the highest concentrations of brook trout waters anywhere: in the Lake Superior Provincial Park area and the area around Pukaskwa National Park. The 5 largest inland lakes in the District - White, Esnagi, Oba, Wabatongushi, and Dog - are significant because of the heavy fishing pressure they support and their importance to the tourist industry. There are also a number of remote lakes, particularly in the north end of the District, which support fly-in tourist camps. This is one of the southernmost concentrations of this type of remote tourist industry in North America. Significant rivers in the District include the Michipicoten which is one of the best spawning rivers on Lake Superior for pink and chinook salmon, rainbow trout, and other species. The Magpie, Fire, and Greenhill Rivers have excellent brook trout fisheries.

2.2 RESOURCE USE

2.2.1 SPORT FISHERY

Angling is a major form of outdoor recreation in Wawa District. Based on provincial and District surveys, it is estimated that about 200,000 angler-days are expended annually in the District (1 angler-day is equivalent to 4 rod-hours of fishing pressure). Of this total, about 170,000 angler-days or 85% occurs in the open-water season, and the remainder is spent on ice fishing.

Creel census results indicate that about 50,000 angler-days are spent on the 5 largest coolwater lakes in the District (White, Esnagi, Oba, Wabatongushi, and Dog) during the open-water season. This is about 30% of the open-water fishing pressure in the District.

About 10,000 angler-days are spent on Lake Superior, based on estimates from creel surveys, derbies, and charter boat operators. About 60% of the District pressure on the lake is on Michipicoten Bay.

It is estimated that about 90,000 angler-days or 45% of the total angling pressure in the District is from U.S. residents. Ontario residents account for the remaining pressure. Our creel survey data indicate that 89% of the fishing pressure on the 5 large coolwater lakes was from U.S. residents.

Walleye is the most preferred sportfish species in the District. However, lake trout and brook trout are the most sought after species in winter; and on Lake Superior, chinook salmon, rainbow trout, and lake trout are most sought after.

The sportfish harvest in the District is currently estimated at about 141,000 kg (Table 3). Of this total, about 50,000 kg or 35% is

walleye, and 20,000 kg or 14% is salmonids from inland waters. Another 26,000 kg of salmonids or 18% of the total comes from Lake Superior. Most of the remaining harvest is pike.

The economic impact of sportfishing is important. The 1985 Ontario sportfishing survey estimated that residents spend approximately $50 per angler-day and non-residents about $60 per angler-day. This includes direct expenditures on food, travel, lodging, gear, etc. and an angling portion of indirect expenditures such as boats, camping gear, ATV's, etc. This translates to an expenditure of about $10.9 million in Ontario generated by angling in Wawa District - $5.5 million for residents and $5.4 million for non-residents. A large part of this expenditure would occur in Wawa District.

2.2.2 COMMERCIAL FISHERY

Commercial fishing has been an important industry on Lake Superior since the early 1800's. In the mid-1950's the lake trout fishery collapsed because of overfishing and the invasion of the sea lamprey. Since then, a number of controls have been placed on the commercial fishery to rebuild the lake trout stocks and harvest the commercial fish species at their sustainable yield. At present, the harvest of each species is limited by quotas assigned to the fishermen.

There are 32 commercial gill net licences on the Wawa District portion of Lake Superior. There are no commercial food fisheries on the inland lakes in the District. The total quota for all species on Lake Superior is 662,996 kg. Most of this quota is chub and lake herring (78%). The lake trout quota is 97,414 kg or 14%, and the whitefish quota is 46,395 kg or 7% (Table 3).

At present, lake trout and whitefish are the main species in the harvest. All of the quota in these species is harvested because of high demand and prices. However, the demand for chub and herring is currently low. These species make up a smaller portion of the harvest with only 11% and 17% of the quota being harvested in 1985. In 1985, total harvest was reported to be 207,475 kg (Table 3) with an estimated value of $492,433.

2.2.3 BAITFISHERY

Over the past decade, an average of 36 bait fishermen have been licenced annually in the District. Commercial bait fishermen are generally licenced on a one per township basis. In 1984, reported harvest was 240,000 minnows worth $30,000.

2.2.4 NATIVE FISHERY

The exact harvest of the native subsistence fishery for the two inhabited Indian Reserves in the District is unknown. Members of the Mobert Band fish primarily on White Lake, and their catch is thought to be lower than the angling harvest. The Michipicoten Band members fish primarily on Lake Superior and Dore Lake, and their catch on Lake Superior is much lower than the angling catch in Michipicoten Bay or the local commercial catch. Members of the Heron Bay Band also fish in Wawa District. Negotiations are ongoing at the federal and provincial level to address native fishery issues.

2.2.5 VIEWING

The number of people who view fish runs is unknown but appears to be increasing. There are many fish viewing opportunities in the Wawa District, particularly of spawning walleye, rainbow trout, and smelt in the spring, and pink and chinook salmon in the fall. The most spectacular viewing is on the Michipicoten River below Scott Falls where over 100,000 pink salmon and 10,000 chinook salmon can be seen.

2.2.6 TOURIST INDUSTRY

A large number of businesses in the District depend on the fishery resource for a large portion of their income. There are 42 lodges in the District, 90 outpost camps or tent sites, 5 fly-in air services, 10 charter boat operations, about 27 motels and hotels, and 21 campgrounds, including 3 Provincial Parks and 1 National Park, a large number of restaurants, food stores, gas stations, fishing tackle stores, etc. The lodges and outpost camps alone have about 20,000 guests annually. Of the estimated 1985 expenditure of $10.9 million generated by angling in the Wawa District, tourists spent an estimated $3.5 million, or one third, at fishing lodges, outpost camps, and air services. Angling expenditures by tourists at other businesses in the Wawa District are estimated at about $2.9 million. Local residents spent an estimated $2.2 million in the District. The remaining 20% of expenditures is assumed to occur outside the Wawa District.

2.3 PROJECTED RESOURCE USE - YEAR 2000

2.3.1 SPORTFISHERY

Angling pressure is expected to increase by 15% to 218,500 angler-days on the inland waters of the District by the year 2000. In the same period the pressure on Lake Superior is expected to increase by 250% to 25000 angler-days. To improve angling quality, our target is to increase average harvest rates for walleye and trout on inland waters by 50% to 1.0 and 0.5 kg per angler-day, respectively, and maintain present harvest rates for other species. These rates are thought to be a more realistic estimate of demand than present catch rates. The target for Lake Superior is to maintain the present harvest rate of 2.6 kg/angler day. Therefore, the inland harvest is expected to increase to 178,250 kg and the Lake Superior harvest to 65,000 kg. The projected harvests exceed the estimated potential yields for inland trout and top predators other than lake trout (chinook salmon, rainbow trout, etc.) in Lake Superior, and is close to the potential yield for walleye. The projected harvests of other species are within their estimated potential yields (Table 3).

These supply and demand projections are complicated by a number of other factors. In particular, the potential fish yield is based on all of the waters in the District, but angling pressure is concentrated in easily accessible areas. Many of the easily accessible lakes in the District are heavily fished and have moderate to low quality angling. There are also many less easily accessible lakes that are lightly fished and have higher quality angling. Consequently, the projected demand for the preferred fish species will greatly exceed the supply in easily accessible areas by the year 2000. This appears to be the case even now, based on angler comments and

creel census data which indicate low to moderate catch rates and generally small fish in many areas. The potential also exists for some loss of fish production to factors such as mine tailings disposal, hydro electric development, logging, other industrial development, acid precipitation, contamination, and spread of detrimental species such as perch in trout waters. However, our objective is to maintain fish production by implementing the Federal Fish Habitat Management Policy requiring no net loss of habitat.

These projections indicate clearly that our fisheries resource is limited. It may be possible to meet some of the increasing demand by accessing more waters, bringing more waters into production for desired species, or rebuilding overfished populations. However, even if all waters were in full production, demand will exceed supply for at least trout and walleye in easily accessible areas and eventually in all areas. Therefore, to accommodate increased angling pressure for tourism or local recreation, or to accommodate development that impacts fisheries, each individual angler will have a smaller share of the fish resource. That is, anglers will on average be taking home fewer kilograms of fish each year, and it may not be possible to achieve the target harvest rates, particularly in accessible areas.

2.3.2 COMMERCIAL FISHERY

The present quotas on the Lake Superior commercial fishery represent the estimated allowable harvest. Therefore, the quotas represent the maximum use that can be accommodated. All of the lake trout and whitefish quotas are presently being taken, and there is no room for additional harvest of these species at present. There is, however, room for some additional harvest of chub and herring if the market for these species strengthens (Table 3).

In the future, there may be room for some additional harvest of lake trout as their stocks rebuild. Therefore, the year 2000 lake trout target is 105,000 kg, up 8% from the present quota. It is also likely that the quotas will change as we gain more knowledge about the status and productivity of the various fish stocks in the lake.

2.3.3 BAITFISHERY

It is expected that the demand for baitfish will increase at the same rate that the sport fishing pressure increases (15%). The projected demand for baitfish in the year 2000 will be well within the production capability of the resource.

2.3.4 NATIVE FISHERY

The native fishery in the District could increase substantially in the future, as many natives regain treaty status. However, we do not have enough information to project the year 2000 harvest by natives.

2.3.5 VIEWING

Fish viewing is expected to increase substantially by the year 2000 as the population grows, leisure time increases, and more people become aware of fish viewing locations. Because viewing is a non-consumptive use of the resource, there is a potential to use viewing to attract tourists to the area and provide local recreation.

2.3.6 TOURIST INDUSTRY

The tourist industry is recognized as an important part of the economy of northern Ontario, and efforts are being made to expand the industry. Consequently, we can expect the tourist industry use of the fish resource to increase by at least as much as the overall projected 15% increase in sportfishing.

2.4 PRESENT MANAGEMENT PRACTICES

2.4.1 HARVEST MANAGEMENT

Harvest management involves harvest assessment and control, to protect fish populations from overfishing.

Harvest assessment of the District's sports fisheries is carried out primarily by creel census programs. A five year creel census program has recently been completed on Dog, Esnagi, Oba, Wabatongushi, and White Lakes. Harvest assessment has also been conducted on Whitefish and Manitowik Lakes, several smaller walleye, lake trout, and brook trout lakes, and the Michipicoten River. The commercial fish harvests are monitored by the Lake Superior Fisheries Unit in Thunder Bay.

Special angling controls have been implemented to protect vulnerable fisheries in several locations in the District. Year-round lake trout sanctuaries have been established on the Mishibishu Chain of Lakes (Mishibishu, Mishi, Katzenbach, and Augusta Lakes) to protect the original Lake Superior lake trout stocks in the lakes. Two other lake trout lakes have special seasons on them to reduce the lake trout harvest: Anaharea Lake and Kabiskagami Lake have a one month winter season (Feb. 15 to Mar. 15). Six year-round sanctuaries and one seasonal sanctuary to protect walleye spawning and concentration areas also occur in the District: 1. HOODOO BAY on Oba Lake - Simpson Twp. 2. LOCHALSH RIVER and LOCHALSH BAY on Dog Lake - Riggs Twp. 3. MURRAY CREEK on Murray Lake - Bruyere Twp. 4. NARROWS on Wabatongushi Lake - Challener Twp. 5. BAY 57 NARROWS on Dog Lake - West Twp. 6. McMURTY NARROWS on Dog Lake - Bruyere Twp. 7. KABINAKAGAMI R. - Lizar and Mosambik Twps. (closed Apr.15-June 15) A no fishing area at Scott Falls dam on the Michipicoten River has also been enforced to protect spawning salmon and rainbow trout.

The protection of fish stocks in most of the District is accomplished by general seasons, and catch and possession limits. The District contains portions of fishing divisions 18, 20, and 23 as described in the Ontario Fishery Regulations.

Since 1984, management of the commercial fishery has been refined through the modernization program with the development of individual species quotas for smaller commercial fishing zones.

There are five Conservation Officers and one Conservation Officer Coordinator in Wawa District. The peak fisheries enforcement period is from mid-April through until early July and during February-March. The main enforcement activities include patrols of the rainbow trout, walleye, and salmon spawning areas to protect against illegal activities, and angler checks during the open water and ice fishing seasons. The present annual fishery enforcement effort is about 30

man-months. In an average year, the officers make 2,800 angler contacts, lay 70 fisheries related charges and issue 100 warnings.

While the Sault Ste. Marie District has a lead role for commercial fishing enforcement in eastern Lake Superior, Wawa District staff are also involved in the monitoring and enforcement of commercial fishing within the Wawa District portion of Lake Superior.

2.4.2 POPULATION MANAGEMENT

Population management involves direct manipulation of fish to increase the populations of desired species, and includes stocking, introductions, and assessment.

Fish stocking has traditionally been a popular technique to rehabilitate individual fish populations, provide artificial fisheries and diversify angling opportunities. From 1983 to 1985, a total of 116,950 brook trout were planted in 52 lakes; 33,195 lake trout were planted in 7 lakes; 16,700 rainbow trout were planted in 5 lakes; and 14,598 splake were planted in 6 lakes. See Appendix 1 for a complete list of stocked lakes in the District. About 60% of the lakes planted with fish are in close proximity to the communities of Dubreuilville, Hawk Junction, Missanabie, Wawa, and White River. About 25% of the lakes are not in close proximity to the communities but are still easily accessible year-round. The other 15% of the lakes are only accessible during the winter. The lake trout are planted as introductions and to rehabilitate depleted stocks in order to create self-sustaining populations. The brook trout are stocked to maintain fisheries where spawning facilities are lacking or absent. The rainbow trout and splake are stocked where competition with perch is a problem, and also to diversify angling opportunities. Assessments to determine the effectiveness of stocking have been carried out on a total of 16 lakes in the District. Lake trout are also stocked into Lake Superior for the purpose of rehabilitating the lake trout fishery. During the last 3 years, a total of 467,045 lake trout have been planted in the District waters of Lake Superior. Assessment indicates that this stocking, in conjunction with harvest controls and the sea lamprey program, has contributed to the recent increase of the lake trout population in Lake Superior.

In the past, the District has carried out four lake reclamation projects to remove undesirable species (pike and perch) using the fish toxins toxaphene and rotenone. Reclamations were conducted on Dead Lake (Cecile Twp.) and Clearwater Lake (Laberge Twp.) in 1962, and on Little Flood Lake (Flood Twp.) and Doc Greig Lake (Brimacombe Twp.) in 1971. The lakes were then planted with trout and have since provided good fishing. The use of live bait on these lakes has been prohibited to prevent reintroductions of undesirable fish species. Live baitfish are also prohibited in the Lake Superior Provincial Park area and the area around Pukaskwa National Park to prevent the establishment of undesirable species in the brook trout lakes in these areas.

The Federal Sea Lamprey Control Centre located at Sault Ste. Marie is responsible for implementing sea lamprey control on Wawa District's portion of Lake Superior. The Agawa, Sand, White, Magpie, and Michipicoten Rivers have been treated with the selective lampricide TFM. This program commenced in 1971 and is ongoing.

The District has also conducted adult fish transfers to 8 lakes in the last 25 years. Walleye, lake trout and rainbow trout have all been transferred in an attempt to create fisheries in suitable waters. Less than half of these projects have been successful.

2.4.3 HABITAT MANAGEMENT

Habitat management involves inventory, assessment, protection, and rehabilitation.

Habitat inventories have been conducted on 417 lakes (79,342.7 ha.) or 47% of the total inland water area in the District. Spawning bed investigations have been done on 6 lakes. In 1981, acid precipitation monitoring included analysis of water samples from 89 lakes and 36 rivers, monitoring of the spring runoff, and the collection of 32 precipitation samples. In 1980, water samples from 109 lakes, 6 rivers and 16 precipitation events were analyzed. Since 1977, fish contaminant samples have been collected from 29 inland lakes, 2 rivers and from 13 sites on Lake Superior.

Habitat protection is accomplished through review of timber, mining and other plans, and through field inspections to ensure implementation of existing legislation (Lakes and Rivers Improvement Act and Fisheries Act), policies (Federal Fish Habitat Management Policy), and guidelines (ie. Timber Management Guidelines for the Protection of Tourism Values, and Guidelines for the Protection of Fish Habitat). The District has recently been involved in discussions with Great Lakes Power Ltd. to better manage water levels and flows in the Michipicoten System for fisheries and power production.

Rehabilitation projects include two lake trout spawning shoals constructed in Wawa Lake. Walleye spawning beds have been improved at Hammer Lake, Fungus Lake, and Fenton Lake. Stream improvement has occurred on Wawa Creek where garbage and junk was removed, and on Trout Creek, tributaries to Lake Superior, and a tributary to Oba Lake where obstacles to spawning fish were removed.

2.4.4 FISHERIES EXTENSION SERVICES

Local fisheries staff provide information to the public through inquiries, news releases, and meetings. Numerous timber, mining, and other industrial projects are reviewed to ensure protection of fish populations and habitat. The staff are also involved with rod and gun clubs, tourist operator groups, municipalities, and other provincial and federal government agencies on fisheries related issues. Since 1983, the Wawa District has been involved with several groups doing fisheries projects under the Community Fisheries Involvement Program (CFIP). These projects have included smelt and pike removal, rainbow and brook trout rearing, walleye transfers and rearing, a smallmouth bass transfer, and spawning bed improvement.

3.0 FISHERIES MANAGEMENT

This section is divided into 2 parts: 1) general management for the entire Wawa District, and 2) detailed fisheries management planning for specific zones within the District.

3.1 GENERAL FISHERIES MANAGEMENT

3.1.1 BACKGROUND

The preceding sections describe the variety of fisheries in the District, the relatively low productivity of this limited resource, the use of the fisheries, and current management. Lake Superior receives heavy use by commercial fishermen but light use by anglers. Many inland lakes receive moderate to heavy fishing pressure and have moderate to low quality angling, while less accessible lakes have higher quality fishing. In general, the quality of angling appears to be declining. Use of the fisheries is expected to increase, and it is assumed that anglers want better fishing. It appears that the demand for trout and walleye already exceeds supply in the easily accessible and heavily fished areas, and will exceed or be close to the total supply in the District by year 2000. This may also be the case for chinook salmon and rainbow trout in Lake Superior by year 2000. As angling pressure increases and demand exceeds supply, the number and size of fish decline and anglers take home fewer kilograms on average. Supply appears to exceed angling demand for pike, lake trout in Lake Superior, and less desired species like whitefish and perch. The commercial fishery is operating close to the estimated potential yield for lake trout and whitefish, and is expected to remain near that level. There appears to be some room for expansion in the herring and chub commercial fishery. The demand for baitfish is expected to be well within the supply. The management of native fisheries is still being determined. Fish viewing is minor but is expected to increase. Fisheries related tourism is very important in the District and is also expected to increase.

3.1.2 DISTRICT OBJECTIVES AND TARGETS

The following objectives indicate in a general way what we are trying to achieve with our fisheries management. The objectives are based on the Provincial fisheries management direction (Section 1.3). Optimizing benefits from fisheries is one of the main objectives of fisheries management in Ontario, and is incorporated in the District objectives. Benefits can be qualitative, such as the type of fishery (commercial or sport, walleye or trout, winter or summer, road access or remote) or quality of fishing (large or small fish, high or low catch rates). Benefits can also be quantitative, such as the amount of each type of fishery or the amount of fish caught. Optimizing fisheries benefits involves: providing appropriate amounts of the desired types of fisheries to accommodate as many different users as possible, providing the desired quality of fishing, and supplying as much of the desired quantity of fish as possible.

The targets are the quantity of fish to be supplied, and they also reflect the quality of fishing because large fish and higher catch rates should result in more kilograms of fish harvested per angler. The targets are based on the year 2000 projected use or demand. The

sportfish targets accommodate the expected increase in angling pressure, an improvement in inland trout and walleye harvests, and the maintenance of other harvest rates. The commercial fish and baitfish targets are the lesser of resource capability or projected use. These targets will amend the present DLUG targets.

Broad fisheries management objective - to protect, enhance, maintain and rehabilitate fish communities and their environment in order to provide an optimum contribution of fish, fishing opportunities and their associated benefits to society.

Sportfish objective - to maintain diversity of angling opportunities within the District and provide increased angling opportunities and angling quality within the limits of sustained yield management.

Commercial fish objective - to provide optimum socio-economic benefits from commercial fish within the limits of sustained yield management.

Commercial baitfish objective - to provide economic benefits from baitfish populations within the limits of sustained yield management.

Inland sportfish target - to meet the anticipated demand of 178,250 kg of sport fish per year by the year 2000 from inland waters.

Walleye - to meet the anticipated demand of 92,000 kg per year by the year 2000 (1.0 kg per angler-day from 0.67 kg per angler-day).

Salmonids - to meet the anticipated demand of 34,500 kg per year by the year 2000 (0.5 kg per angler-day from 0.33 kg per angler-day).

Northern pike - to meet the anticipated demand of 46,000 kg per year by the year 2000 (at present rate of 1.0 kg per angler-day).

Other species - to meet the anticipated demand of 5,750 kg per year by the year 2000 (at present rate of 0.5 kg per angler-day).

Lake Superior sportfish target - to meet the anticipated demand of 65,000 kg of top predators per year by the year 2000 from Lake Superior (at present rate of 2.6 kg per angler-day).

Lake trout - to meet the anticipated demand of 50,000 kg per year by the year 2000.

Other species (includes chinook and coho salmon, rainbow, brown and brook trout, walleye and northern pike) - to provide the estimated total supply of 15,000 kg per year by the year 2000.

Commercial fish target - to meet the anticipated demand of 299,091 kg of commercial fish per year by the year 2000.

Lake trout - to meet the anticipated demand of 105,000 kg per year by the year 2000.

Coregonids (includes whitefish, herring and chub) - to meet the anticipated demand of 194,091 kg per year by the year 2000.

Commercial baitfish target - to meet the anticipated demand of 28,750 dozen baitfish by the year 2000.

3.1.3 PROBLEMS AND ISSUES

There are a number of problems and issues affecting the achievement of the fisheries objectives and targets.

Exploitation: Exploitation appears to be the main problem affecting many fisheries in the District. Fish production in the District is relatively low because of the short growing season and low nutrient levels in the water. For example, annual production is usually no more than 0.5 kg/ha for lake trout, and 1.5 kg/ha for walleye (a kg/ha is close to a lb/acre). Therefore, it is very easy to overfish a population - that is, take more kilograms of fish than are being produced. If harvest exceeds production, average fish size declines because fish are taken out before they can grow to a larger size. The fish population may also decline which results in a lower catch rate. Total production from the lake will decline below its potential if not enough fish are present to take full advantage of the productivity in the lake. Therefore, angling quality declines and fewer fish and fishing opportunities can be provided. This is very noticeable in newly accessed lakes where fishing is good for 1 or 2 years, then drops off to a moderate or poor level. Based on angler comments and our creel census data, catch rates and size of fish are less than desired on many lakes in the District. These lakes are often easily accessible and heavily fished, but some are remote lakes that are heavily fished by air or snowmachine. Even lightly fished lakes can be overexploited if they are small or have low productivity. The only way to increase production or increase the quality of fishing on many of these waters is to control harvest to retain a larger population of fish. Generally, as the fish population increases, catch rates and the size of fish increase, and total weight of catch increases. Therefore, control of exploitation can increase angling quality and provide more fish, fishing opportunities, and benefits. However, many anglers do not favour additional regulations to manage fisheries.

The exploitation problem is presently most acute on inland trout and walleye fisheries. Use may already exceed productivity for these species in many easily accessible and heavily fished parts of the District, and projected demand will certainly exceed the supply in these areas by the year 2000. This may also be the case for chinook salmon and rainbow trout in Lake Superior by year 2000. So, it may not be possible to attain the target harvest rates for these preferred species in many areas. Average harvest per angler may decline as demand increases and supply stays fixed, because the limited resource is spread among more anglers. One of the consequences of additional pressure on fisheries from increased tourism, cottaging or local recreation is that the harvest available to each angler declines. The resulting decline in harvest, catch rate, and fish size may reduce the value of the fishery for tourism and local recreation. At present, only lake trout in Lake Superior, some pike populations, and less desirable species such as whitefish and perch appear to be capable of supporting more than the projected angling pressure. However, it is difficult to direct development to these species because of access problems on Lake Superior and lower preference by anglers.

The exploitation problem is similar in the commercial fishery. If stocks can be rebuilt, catch rates and total harvests can be increased which will reduce costs and increase revenue. There does not appear to be an exploitation problem with baitfish.

Fish Community Structure: The fish community in the lake or stream can be a limitation to fish production for both sport and commercial fisheries. Some of our most desireable fish species do not survive well under predation or competition from certain other species. For example, brook trout do not do well if yellow perch or northern pike are present, and lake trout are seriously affected by the sea lamprey. Also, in some lakes, predation or competition from unexploited species such as whitefish, perch, suckers, and burbot, may be helping to suppress already heavily exploited sportfish species. Problems with introductions and imbalances are likely to increase. In addition, many waters in the District could be contributing to sportfish production but do not have highly desirable sportfish such as walleye, lake trout, and brook trout. If these problems can be solved more fish, fishing opportunities, and benefits can be provided.

Habitat Loss or Degradation: In some parts of the District, habitat problems are quite serious for the sport fishery, but there do not appear to be major habitat problems affecting the commercial fishery. In two sections of the District, acid precipitation has seriously reduced sportfish production. Water fluctuations impact the fish populations in the reservoir lakes and downstream waters of the Michipicoten River and Montreal River hydro electric developments. The new Magpie River hydro development will also affect fisheries. In addition to exposing spawning beds, the water fluctuations reduce aquatic vegetation and invertebrates in shallow waters, which provide important cover and food for fish. Habitat loss can also result from mining activities, road construction, logging, industrial pollution, and shoreline development. In some waters, the habitat may be naturally deficient - for example, lacking a spawning bed or cover for juvenile or adult fish. Loss of habitat is likely to increase as resource development increases. Solving the habitat problems can provide more fish, fishing opportunities, and benefits.

User Conflicts: Some problems relate to the use of the fishery. User conflicts occur when there is not enough of a limited resource to satisfy two or more user groups. They can be defined as one group blaming another group for a perceived reduction in their share of the resource. Some examples in Wawa District are: Sport and commercial fishermen on Lake Superior both compete for lake trout, and the catch of forage fish and incidental catch of sportfish by commercial fishermen is perceived to be a problem by anglers. Anglers also compete with Natives in some areas. Among anglers, residents and non-residents compete for the same resource. Local anglers are concerned about the influx of non-residents to the accessible parts of the District, and the limited access to many tourist camp lakes which are used primarily by non-residents. Conversely, tourist outfitters are concerned about increased use by local anglers and non-paying non-residents on the lakes where their businesses are located. Some anglers are concerned about the steady erosion of high quality less accessible fisheries as access roads for logging and mining expand throughout the District, while other anglers want easy access to these areas. User conflicts will increase as pressures on the resource increase. Managing these conflicts to provide for all users and optimize benefits from fisheries is very difficult.

3.1.4 MANAGEMENT ACTIONS

Harvest Management: Because one of the main problems affecting the productivity and quality of fisheries in the Wawa District is exploitation, management of these fisheries must include harvest control. Harvest management is necessary to protect existing high quality fisheries, and rebuild over-exploited fish populations to help meet the current and projected demand on the resource.

In the sportfishery, exploitation is most important on inland trout and walleye, and Lake Superior chinook salmon and rainbow trout. Demand for these species already exceeds supply or may exceed supply by the year 2000 in many areas of the District (Table 3). If we do not address exploitation of these species, their stocks will decline, angling quality will diminish, fishing opportunities will be reduced, and benefits to tourism and local recreation will be reduced. Because of the widespread nature of the exploitation problem, regulation changes are being looked at on a Province-wide basis. At present, Provincial lake trout regulations and all sportfish regulations on Lake Superior are being examined. Some overall regulation changes in the District will result from this Provincial process. Public comments also indicated general agreement with the idea of applying special regulations on selected waters to rebuild some fisheries and provide some trophy fisheries. Therefore, it is proposed that combinations of additional controls (catch limits, size limits, seasons, sanctuaries, and gear) be experimented with on a few lakes to try to find the most acceptable and effective methods of rebuilding and enhancing specific fisheries. If the demand for fish in the District is to be met, it will eventually be necessary to implement additional controls on many waters to rebuild and protect stocks.

In the commercial fishery, the main method of harvest control will be the adjustment of quotas to reflect fish stock strength. Baitfish harvesting will continue to be based on the individual area licences.

Public comments indicate concern about enforcement of regulations. Enforcement effort will be scheduled in proportion to known problem occurences and angling pressure. Effort can then be adjusted up or down based on violation rate. Emphasis will also be placed on explaining the purpose of the regulations to increase understanding and promote compliance. Prompt reporting of violations will be encouraged using the MNR toll-free number for anonymous reports.

Fish Community Management: To increase the amount of fish, fishing opportunities, and benefits, a major effort will be placed on introducing walleye, lake trout, and brook trout into suitable waters where they are now absent. Effort will also be directed at reducing competition and predation on sportfish from other species - for example: lake reclamation to remove perch from brook trout lakes, splake stocking in perch lakes, live baitfish prohibitions, and coarse fish removal. Lamprey control will also be carried out by the Federal government. Fish stocking will be expanded, particularly near communities, to provide fisheries in waters where spawning is inadequate but other habitat is suitable. Lakes with low use will not be stocked. Fish introductions, stocking programs, and reduction of undesirable species are expensive projects. However, more of these projects could be accomplished with help from clubs or groups under the Community Fisheries Involvement Program (CFIP). Under this

program a group proposes a project they are interested in doing. If approved, the group provides labour and equipment, and the MNR provides technical help and funding for special equipment and supplies. However, even with this help, these projects will provide relatively small increases in total fish production, and will not keep pace with projected demand.

It should be noted that these fish community management techniques often meet with limited success. Less than half of the fish transfers in the District have been successful. Even successful introductions take 10 to 15 years to provide good fishing. Lake reclamations may not be practical if the entire watershed has been invaded by the unwanted species and recolonization could occur. At present, lake reclamations are also strictly limited and controlled as part of a class Environmental Assessment. Stocking success can also be poor, particularly if predators or competitors such as pike, perch, or ling are present. Supplementary stocking on top of existing populations to rebuild stocks reduced by exploitation is also generally unsuccessful. The number of young fish that survive is usually limited by food or habitat. The existing population can usually produce enough young to more than fill the capacity of the environment (every female can produce thousands of young). Adding more young from the hatchery will not increase the survival of young if the environment is already saturated. In most of our waters the production of young fish is not a problem. The problem is that too many of these fish are being taken by angling before they reach a more desirable size. Smaller numbers of fish escape to older age classes, so the catch rate, size of fish, and harvest decline, but reproduction remains successful. Stocking will work only if the adult population is too small to produce enough young for the capacity of the lake, or if spawning is unsuccessful because of habitat. Therefore stocking could benefit many lakes in the District where spawning beds are absent or acidification is affecting reproduction, but there are probably few lakes where exploitation is severe enough for stocking to be beneficial. With the increase in Provincial hatchery capacity from fish licence funding, it is expected that there will be enough fish to meet most demands.

Habitat Management: The majority of the fish habitat in the District is unimpaired, and emphasis will be placed on protecting this habitat and mitigating any losses from mining, hydro, and other developments. Efforts will also be directed at existing habitat problems. Research to reduce the effects of acid precipitation on fisheries in the District will be encouraged. Effort will also be directed at managing water fluctuations in reservoirs to optimize power and fish production. Other habitat management could include elimination of siltation or pollution sources, installation or rehabilitation of spawning beds, and the provision of cover in specific areas where problems are identified. Some of these projects could be done by clubs or groups under CFIP, enabling more to be accomplished. However, habitat management also has high direct or indirect costs and often limited success, and will provide relatively small increases in total fish production compared to increasing demand.

Use Management: Managing the use of the fisheries in the District to obtain optimum benefits is very difficult because of conflicts between users of the resource. Optimizing benefits involves: providing

appropriate amounts of the desired types of fisheries to accommodate as many different users as possible, providing the desired quality of fishing, and providing as much of the desired quantity of fish as possible. User conflicts imply that there is not enough of the resource to satisfy all users. That is, the resource is limited and must be partitioned in some manner to optimize benefits. Partitioning the resource to accommodate all users while minimizing user conflicts should optimize benefits by maintaining diversity and providing the best possible combination of fishing quality and quantity.

The resource can be partitioned by separating user groups. Separation of users may reduce conflicts and increase benefits because each group has exclusive use of a portion of the resource with their desired type or quality of fishery. However, conflict will still exist over the total amount of the resource available to each group. Optimization of benefits occurs when an appropriate amount of the resource is allocated to each user group as determined by demand. The allocation can be direct or indirect. For example, access can separate users indirectly - about half the District is easily accessible by road, the other half has varying degrees of access by walking, ATV's, snowmachine, water, rail, and air access. This distribution of access should help optimize benefits by providing an appropriate range of angling opportunities, from many easy access fisheries near communities and road corridors to some very remote access fisheries in the periphery of the District. Road access can also be controlled directly to protect remote angling opportunities. On Lake Superior, the sport and commercial fisheries have direct allocations of fish to optimize benefits (based on public input, the sportfishery received about half the lake trout yield and all of the other sportfish yield, the commercial fishery has half the lake trout yield and all other species yields). Angling-only zones are also used to separate sport and commercial fishermen to provide more benefits to anglers in certain areas and optimize overall benefits. Non-residents may be separated from other users by Crown Land camping restrictions in certain areas to improve benefits to other users. The location of developments such as cottages or tourist camps can also be managed to separate users and improve benefits for one group or another. In other cases the user groups have not been separated. For example, non-residents and residents, tourists and local residents, and natives and non-natives often use the same fishery. In these cases, benefits accrue in proportion to each groups demand on the resource and this distribution of benefits is assumed to be optimum. It is possible that these groups may be separated in certain areas to protect local fisheries, remote tourism, or native rights.

Where user conflicts occur, there is a tendency for groups to want to reduce the use of the resource by competing groups. But to optimize benefits, as many different users as possible should be accommodated. Therefore, all users must accept a smaller share of the limited fishery resource - that is, catch will be reduced. Some effort will be spent informing competing groups about each others needs and the benefits they produce, to promote mutual acceptance. Effort will also be made to inform users about the limitations of the resource. It must be realized that increasing fishing pressure from tourism, local recreation, or other uses will decrease the amount of fish available to each individual user. More users can also be accommodated if non-consumptive or less consumptive uses of the fishery are promoted;

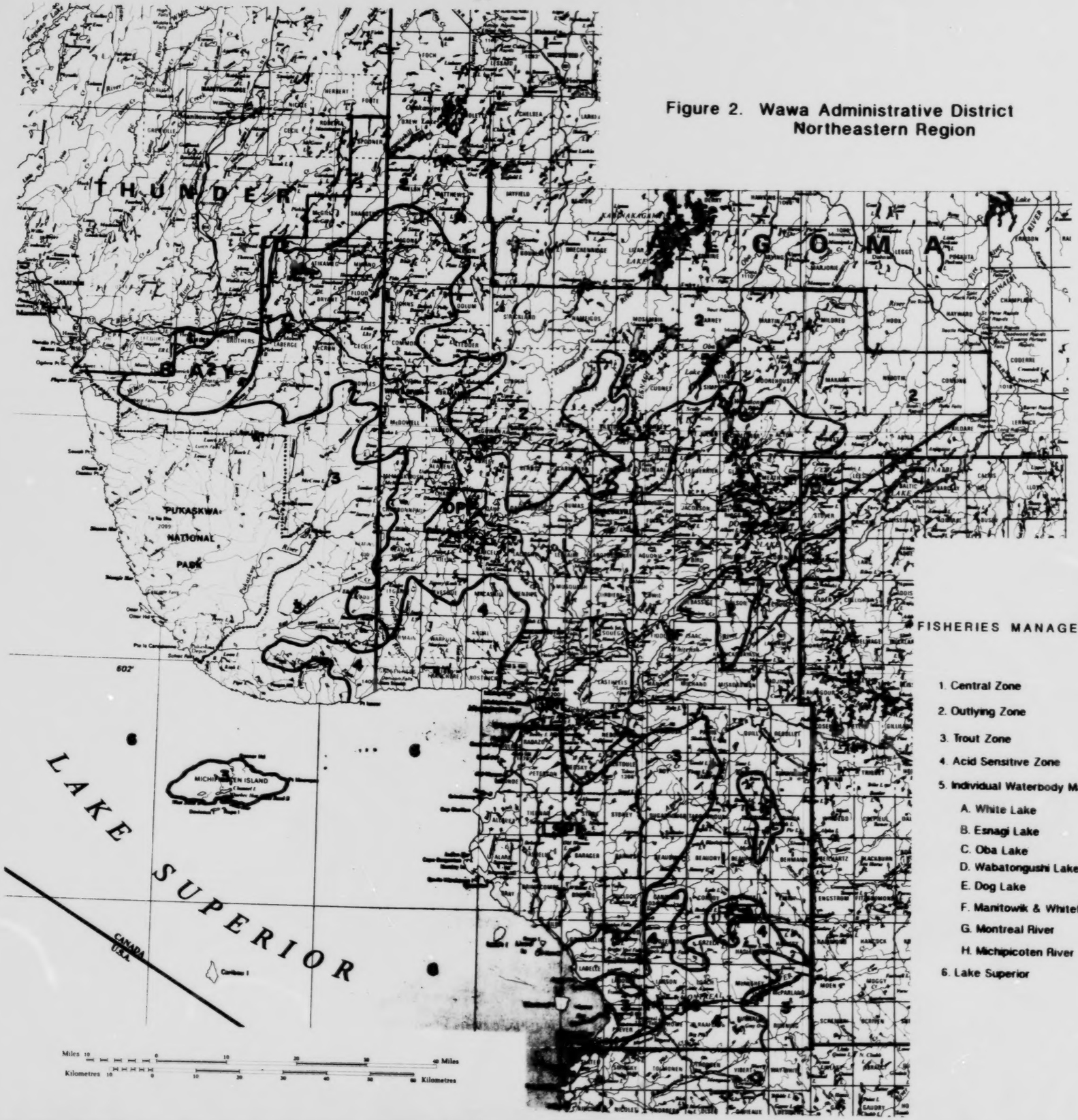
for example, viewing, catch and release, and other activities while fishing. Increased use can also be directed at under-used stocks, such as lake trout in Lake Superior, some pike populations, whitefish and perch. Use will also be managed by controlling development.

Finally, in some situations benefits may be optimized by providing greater harvests to individual fishermen. To achieve this, it may be necessary to limit the number of people using the fishery. This is the approach taken for the commercial food and baitfish fisheries, but is not proposed for any angling fisheries.

3.2 DETAILED FISHERIES MANAGEMENT

The fisheries within Wawa District are quite diverse. These fisheries serve different needs, have different problems, and therefore require different management actions to optimize benefits. To simplify the discussion of management actions, the District is divided into 6 zones (Figure 2). The zones delineate fisheries with similar objectives, problems, and management needs. Zone discussions are divided into 4 sections: 1) a background section describing the fishery in the zone and its use; 2) objectives for the zone - that is, the type of fishery to be provided; 3) problems and issues affecting the fisheries in the zone; 4) fisheries management actions to solve the problems and achieve the objectives. This section indicates the type of management that will occur in these areas to the year 2000. The boundaries are for planning purposes only, and are not legislative or regulatory.

Figure 2. Wawa Administrative District
Northeastern Region



ZONE 1. CENTRAL ZONE

This is the largest inland fisheries management zone in Wawa District at 8600 km or 38% of the District excluding Lake Superior. It includes the areas adjacent to Highways 17, 101, 519, 547, 651, and most of the existing logging and mining access roads, as well as most of the ACR land in the District. This zone also includes the local areas surrounding the communities of Wawa, Hawk Junction, White River, Dubreuilville, and Missanabie which have been identified as intensive fisheries management areas. Dog, Wabatongushi, and White Lakes are in the zone but are treated separately in Zone 5.

At present, this zone is recognized for its moderate quality coolwater fisheries of walleye and northern pike. In addition, 23 lake trout lakes and some brook trout lakes occur in the zone. Fishing pressure and harvest appear to be moderate to heavy throughout the zone, and angling quality appears to be moderate to low based on creel census information from some walleye and lake trout lakes and other information from anglers.

Because of the existing access, this is the most heavily used zone in the District. Most of the angling by local residents and a large part of the fishing by tourists occurs here. Consequently, much of our fisheries management will be concentrated in this zone.

Objectives

The objectives for fisheries management in this zone are to harvest the major sportfish species (walleye, northern pike, lake trout, and brook trout) at close to their natural maximum sustainable yield, and increase the angling opportunities and angling quality (size and catch rates) for local residents and tourists.

The specific objectives for the zone are to:

- implement the appropriate management to harvest close to the natural maximum sustainable yield of sportfish.

- improve catch rates and fish size on 10 existing sportfish populations with emphasis on lakes close to communities.

- establish 10 new stocked brook trout or splake populations with emphasis on lakes close to communities.

- establish 10 self-sustaining walleye populations.

- establish 5 self-sustaining lake trout populations.

- establish 5 self-sustaining brook trout populations.

- establish 1 self-sustaining aurora trout population.

Problems

Angling harvest is thought to be the major impact on the fisheries in the zone, particularly on walleye and trout where demand appears to exceed supply. Heavy harvest reduces fish stocks which reduces catch

rates, size of fish, and eventually total harvest. This decline in the quality and quantity of fish reduces the benefits that the fishery can provide to local residents or tourism.

Several aspects of the fish communities in the zone affect the supply of sportfish. Many of the pike lakes in the zone lack walleye, but appear capable of supporting them - which would help meet the demand for this species. Also many lakes in the zone appear to have potential for lake trout, but have only pike at present. Lakes suitable for brook trout introductions are harder to find. Introductions of undesirable species is also a problem - perch introductions have virtually eliminated brook trout production in several lakes. A large portion of the potential yield of the zone is in under-used species, such as whitefish and perch, which could provide additional angling opportunities. Competition or predation from under-used species may also be reducing sportfish production.

Habitat damage from mining, logging, roads, industrial, municipal, and other development is a problem in some areas. Natural degradation (siltation, mercury) also occurs. Although important in some areas, habitat degradation is a minor problem compared to harvesting.

Some user conflicts over the fish resource exist between residents and non-residents, and between local residents and tourist operators.

Fisheries Management Actions

1. **Assessment**

- angler surveys - to assess fish stocks, harvest, and angling quality in the zone:
  - major walleye lakes (Kabenung, Fungus, Knife, Obatanga, Hammer, Pokei, Negwazu, Hawk, Anjigami, Shabotik-Danny Lake area, White River, Dubreuilville area, Missanabie area).
  - important lake trout lakes (Wawa, Blacktrout, Loonskin, Goetz, Bauldry, Tukanee, Caribou, Kwinkwaga, Troupe, Missanabie area).
  - lakes for special management (Bare Tent chain, Picnic, Rennie)
  - tourist camp lakes in conjunction with operators.
  - stocked lakes.

- lake surveys - to collect habitat and fisheries information:
  - lakes with potential for introductions or stocking (large lakes, and lakes near communities and road corridors).
  - lakes proposed for special management
  - lakes with suspected fish community or habitat problems (lakes near communities and road corridors).
  - lakes in watersheds where sportfish species are unknown (Doucett Twp.).
  - all walleye and trout lakes.

- habitat surveys - on major walleye and trout lakes and suspected problem areas to identify habitat for improvement.

- special management plans - conduct assessments and prepare detailed fisheries management plans for Wawa Lake, the areas around each community, Kabenung and Negwazu Lakes.

2. **Harvest management**

- standard Provincial regulations - will be used to control harvest in most of the zone. The Provincial lake trout regulations are currently under review. Shorter season, size limits, lower catch limit, and other techniques are being considered to protect stocks. Reviews of the Provincial walleye and brook trout regulations may follow. Until these reviews are complete, the regulations will remain the same on most waters.

- special experimental regulations - are proposed to enhance some fisheries near the communities and in the Obatanga Provincal Park area. The purpose of the regulations is to increase the fish populations, catch rates, and average sizes of fish. Anglers will then have a better chance of catching a fish, bites will be more frequent, and larger fish will be caught.

  walleye - community lakes (Picnic, Bare Tent - Upper Lola chain, Hawk, Rennie) and Obatanga Provincial Park (Obatanga, Knife, Burnfield, Cotton, etc.) - catch limit of 2, only 1 greater than 40 cm and 1 less than 40cm. Murray Lake - slot size limit, see Dog Lake 5E.

  lake trout - community lakes (Tukanee, Troupe, Blacktrout) - catch limit of 2, only 1 greater than 40 cm and 1 less than 40 cm, artificial bait only, winter season from 15 February to 15 March, summer season from 3rd Saturday in May to 30 September. Dog Lake is the candidate for the Missanabie area (Zone 5).

  brook trout - community lakes (Paint, Rock, Oakley) - catch limit of 2, only 1 greater than 40 cm and 1 less than 40 cm. A lake was not selected near Missanabie because of the limited number of brook trout lakes near this community.

  pike - test lake (Kinniwabi) - catch limit of 2, only 1 greater than 70 cm and only 1 less than 70 cm.

  Because these regulations are experimental, the fisheries will be assessed at intervals and the regulations may be altered. For example, the number of lake trout reaching the 40cm class may not be enough and a minimum size limit may be required.

- sanctuaries - to protect walleye spawning concentrations on Fungus, Knife, Kabenung and Shikwamkwa Lakes and other areas that may be identified for protection, from 15 March to 15 June.

- information - to gain support for management, inform anglers about limited fisheries productivity, purpose and results of regulations, and proper release techniques. Sign all lakes with special regulations.

- enforcement - schedule 35% of the fisheries field enforcement in the District on the zone to ensure compliance with regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

3. **Fish community management**

- introductions - establish new self-sustaining sportfish populations by transferring adult fish or stocking hatchery fish. Priority will be given to large lakes and lakes near communities and road corridors. Possible projects for groups.

  walleye - to Doss, Scully, St. Julien, Crouch, Elbow, Evans Creek watershed, Dreany, Morrison, Goudreau, Cradle, Cawdron, Bukwaskeagog, Curry, Jackpine R., Kennedy, Shakashi, Crozier, Roller, Mishewawa, Kashog, and other lakes near communities and road corridors as identified (particularly near Wawa).

  lake trout - to Lovedee, Ellen, Eaglet, Iron, Jimmy Kash, Goldie, McCormick, Strobus, Catfish, Lena, Deep, Reed, Walbank, Bremner, Vanreek, Stranded, Kearns, Byron, Mile, Shikwamkwa, Eleven Mile, Blackspruce, and other lakes near communities and road corridors as identified (particularly near White River and Dubreuilville).

  brook trout - to lakes near communities and road corridors as identified (particularly near Dubreuilville and Missanabie).

  aurora trout - to a lake suitable for natural reproduction.

- stocking - to maintain sportfish populations in lakes without sufficient spawning or appropriate fish communities: - brook trout - Appendix 1, and other lakes near communities and road corridors as identified.
  - splake - lakes affected by perch introductions - North Buck, Bremner, Ward, Anderson, Reed and other lakes as identified.
  - lake trout and walleye - heavily used lakes as identified.

- lake reclamation - consider where introductions of perch or other species have reduced trout production. Fish toxins, explosives, netting, water level manipulation, or large predators could be used. Use of this technique will be limited as class environmental assessment is being prepared. Candidate lakes are Anderson, Ward, Reed, Green, North Buck, Kevin, Little Tangent.

- reduce competition and predation - reducing under-used fish such as suckers and burbot may improve sportfish production. Increasing the number of large sportfish may also reduce these other species. Possible CFIP projects for groups.

4. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M, MOT, GLP, ACR, AOD). Guidelines for logging, road construction, mining, and other development near waters will continue to be applied.

- information - inform land and water users about fish habitat and regulations to promote protection. Provide guidelines and prepare a brochure outlining habitat protection for all activities near water.

- spawning areas - improve existing areas or create new areas if reproduction is limiting. Possible candidates are Picnic, Bogle, Burnfield, Cotton, Bare Tent. Possible projects for groups.

- nursery and adult habitat - add cover such as vegetation, trees, boulders, structures, or depth. Possible group projects.

- reduce siltation - stabilize eroding crossings and banks. Remove silt from pools and riffles. Herman and Wawa Creeks and waters downstream of some road crossings. Possible group projects.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again, and inform anglers of proper release techniques.

- redirect pressure to under-used species - inform anglers where and how to catch whitefish and perch.

- viewing - provide information on viewing spawning runs of fish.

- access management - in conjunction with MOT, improve parking and access to a variety of lakes along highway corridors. Encourage road access to lakes along other roads if habitat is protected.

- signs - provide lake name and fish species signs for all stocked lakes and a variety of highway corridor lakes to encourage use.

- cottage and tourist development on Crown Land - will be considered where conflicts with other users are minimized and where the fishery can support additional pressure. Such developments may result in a decline in angling quality. Special controls may be considered to protect the fishery.

- reduce conflicts - inform the public about the tourist industry and encourage operators to offer special packages to local residents to promote acceptance of tourism. Encourage joint projects to improve fisheries.

- upgrade tourist camps - encourage tourist operators to improve facilities and services to obtain more revenue with less consumption of the resource (see Zone 2).

ZONE 2. OUTLYING ZONE

The Outlying Zone is about 5700 km^2 or 26% of Wawa District, excluding Lake Superior. It lies mainly along the northern perimeter of the District, but also includes smaller areas away from roads in the other parts of the District. Esnagi and Oba Lakes occur in the zone, but are treated separately in zone 5. Access is primarily by trail, water, air, and rail, although Highway 631 and some other roads occur in the zone. Snowmachines provide access in winter.

The zone is recognized for its more remote, moderate to high quality fisheries - particularly walleye and northern pike, but also lake trout and brook trout. Some quantitive information on fish stocks has been collected in the zone, and we have some qualitative information on harvest, catch rates, and fish size.

There are 35 outpost camps and 1 lodge in the zone. Much of the summer pressure on the lakes is from tourist industry guests and other tourists, and most of the winter pressure is from local residents. A large part of the area will be logged in the next 20 years.

Because of the generally higher quality angling and lower pressure on this area at present, less intensive fisheries management will occur in this zone than in the Central Zone.

Objectives

The objectives for the zone are to harvest the fisheries at the natural maximum sustainable yield, maintain the variety of access in the zone, increase remote angling opportunities, and increase angling quality (size, catch rates, and species diversity). Retaining the variety of access and higher quality fisheries in this area is important to maintain the diversity of angling opportunities in the District to optimize benefits. These fisheries will provide various types of remote tourism opportunities to benefit the local economy, and provide high quality angling for local residents.

The specific objectives for the zone are to:

- implement the regulations and policies necessary to maintain the variety of access to the zone and protect and improve the quality of the fisheries.

- improve catch rates and fish size on 5 existing sportfish populations.

- establish sportfish populations in 10 additional lakes (5 walleye, 2 lake trout, 3 brook trout).

- establish trophy fisheries in 2 waters (1 lake trout, 1 brook trout).

- maintain existing remote tourist operations in the zone, and consider limited additional tourism development.

Problems

Angling harvest is limited to various extents by the access to the zone. However, based on angler checks and reports, there has been enough harvest from many of the waters in the zone to reduce angling quality to moderate levels - that is, smaller sizes and lower catch rates. Therefore, harvest management is needed to protect or improve angling quality on many waters in the zone.

Some waters in the zone could provide additional sportfish production, but are lacking preferred species such as walleye or trout. Also a large portion of the total potential fish yield in the zone is in under-used species, such as whitefish and perch. These species could provide increased harvest and diversity for anglers, but it is difficult to divert pressure to them. Competition or predation from under-used species may also be reducing sportfish production. The introduction of perch or unwanted minnow species into trout waters is a potential problem.

Habitat problems are minor at present. Shoreline development, logging and mining has resulted in local habitat disturbance in some areas and there may be some natural degradation of spawning or other habitat. However, the potential for habitat disturbance will increase as more logging, mining, and road construction activity occurs in the area.

A major conflict over the use of the fish resource in this zone exists among local residents, non-residents, and tourist operators. A major conflict also exists over road access to the zone. Tourist operators in the zone and many anglers want to retain the remote nature of the zone, while the logging companies, other tourist businesses, and other anglers, want road access to the area.

Fisheries Management Actions

1. **Assessment**

- angler surveys - to assess fish stocks, harvest, and angling quality in the zone: particularly on tourist camp lakes in conjunction with operators, and on stocked lakes.

- lake surveys - to collect habitat and fisheries information:
  - lakes with existing tourist camp operations (East Line, Bruce, Fred, Wejinabikun, North Wejinabikun, Cheesehead, Loon, High).
  - lakes with potential for introductions or stocking.
  - lakes with relatively heavy use (Glasgow, Loch Lomond, Loch Katrine).
  - lakes with potential for tourist operations (as identified).
  - lakes in watersheds where sportfish species are unknown (Cooper Twp.).
  - all walleye and trout lakes.

- habitat surveys - on major walleye and trout lakes and suspected problem areas to identify habitat for improvement.

- calculate potential yields - of sportfish species on all lakes with tourist facilities, using the morphoedaphic index (MEI). Estimates of the allowable harvest and pressure will help tourist operators manage their operations on those lakes.

2. **Harvest management**

- standard Provincial regulations - will be used to control harvest in most of the zone. The Provincial lake trout regulations are currently under review. Shorter seasons, size limits, lower catch limits, and other techniques are being considered to protect lake trout stocks. Reviews of the Provincial walleye and brook trout regulations may follow. Until these reviews are complete, the regulations will remain the same on most waters.

- special trophy regulations - are proposed for 2 areas in the zone to maintain exceptionally high quality angling for both tourists and local residents.

  lake trout - Dayohessarah Lake - catch limit of 2, only 1 greater than 40 cm, only 1 less than 40 cm, winter season from 15 February to 15 March, summer season from 3rd Saturday in May to September 30, artificial bait only.

  brook trout - Kabinakagami River and tributary lakes in Broughton and Atkinson Townships (Newcombe, etc.) - catch limit of 2, only 1 greater than 40 cm, only 1 less than 40 cm, artificial bait only.

- sanctuaries - to protect important walleye spawning concentration areas as identified.

- information - to gain support for management, keep anglers informed about limited fisheries productivity, purpose of regulations, implementation and results of special regulations, and proper release techniques.

- enforcement - schedule 10% of fisheries field enforcement in the District on the zone to ensure compliance with regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

3. **Fish community management**

- introductions - establish new self-sustaining sportfish populations by transferring adult fish or stocking hatchery fish. Possible projects for groups.

  walleye - Dave, Daisy, Fulcher, Shasta, Mank, Loam, Dickie, White Birch, Roderick, Buddy, Lobo and other lakes as identified (particularly near communities).

  lake trout - to Fearless, Jumbo, Boulder, McEwen, and other lakes as identified.

  brook trout - to Wabenung and other lakes as identified (particularly west of Hwy. 651, in other trout watersheds, and near communities).

- stocking - to maintain sportfish populations in lakes without appropriate spawning areas.
brook trout - Appendix 1 and other lakes as identified (particularly near communities and to deversify fisheries near heavily used walleye lakes).

- live baitfish prohibition - for the brook trout waters of the Kabinakagami, Fire, and Greenhill River systems to prevent the introduction of perch and unwanted minnows.

- reduce competition and predation - removing under-used species such as suckers and burbot may improve sportfish production. Increasing the number of large sportfish may also reduce these other species. Possible group projects.

4. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M, MOT). Guidelines for timber harvesting, road construction, mining, and other development near waters will continue to be applied.

- information - inform land and water users about fish habitat and regulations to promote protection. Provide guidelines and prepare a brochure outlining habitat protection for all activities near water.

- spawning areas - improve existing areas or create new areas if reproduction is limiting. Possible projects for groups.

- nursery and adult habitat - add cover such as vegetation, trees, boulders, or depth. Possible group projects.

- reduce siltation - stabilize eroding crossings and banks. Remove silt from pools and riffles. Possible group projects.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again, and inform anglers of proper release techniques.

- redirect pressure to under-used species - inform anglers where and how to catch whitefish and perch.

- redirect pressure to other areas - improve angling in more accessible areas to divert pressure and help maintain the remote, high quality fisheries of the zone.

- road management locate roads at least 120m, and preferably more than 250m, from all sportfish waters to prevent road access campsites and help retain the remote high quality nature of the zone. Lakes will be from 120m to several kilometers from roads, providing various degrees of remoteness for anglers. Some lakes with remote tourist operations will require additional protection from road access to maintain the remote component of the tourist industry and provide this type of angling opportunity.

- boat caches - could be controlled on specific problem lakes to maintain a remote, high quality fishery.

- cottage development - is not proposed on Crown Land at present. This will help retain the remote, high quality nature of the zone.

- tourist development - limited expansion of the remote tourist industry will be considered where conflicts with other users are minimized and where the fishery can support additional pressure. Special controls to protect the fishery may be required.

- reduce conflicts - inform the public about the remote tourist industry, encourage tourist operators to offer special packages to local residents to promote acceptance of this type of fishery. Encourage joint projects to improve fisheries.

- upgrade tourist camps - in conjunction with MNR, encourage tourist operators to improve their facilities and services to obtain more revenue with less consumption of the resource. Fish harvest can be reduced by providing other meats for meals including shore lunches. Comfort facilities (such as screened porches, fireplaces, saunas, and lounges) and other activities (wildlife viewing, hiking, tennis, etc.) may also reduce harvest and help maintain high quality fishery and experience.

ZONE 3. TROUT ZONE

This zone includes 6200 km^2 west and northwest of Wawa and surrounding Pukaskwa National Park, and south and southeast of Wawa comprising most of Lake Superior Provincial Park, some ACR land, the north part of the Tikamaganda Road area, and Michipicoten Island Provincial Park. The zone makes up 28% of Wawa District, excluding Lake Superior. Vehicle access in a large part of this area is currently restricted by park regulations, the absence of roads, or poor quality roads. Most access is by trail, water, air, rail, ATV, or snowmobile. However, Hwy. 17 and some logging, mining, and park roads occur in the zone.

The zone is recognized for its more remote, high quality, native brook trout fisheries. Only a small amount of quantitative information on harvest or angling quality has been collected in the zone. This data and angler comments indicate some of the waters have low to moderate quality fisheries, particularly along the Highway 17 corridor. The more remote lakes have higher quality angling. Some lake trout and pike waters also occur in the zone. The tributaries to Lake Superior in the zone have spawning runs of several fish species, and are discussed in the Lake Superior zone. The zone also includes the Mishibishu sanctuary chain of lake trout lakes which will continue to be used as an egg source for the Provincial fish culture system and for the District's lake trout introduction program.

The major developments in the zone are Lake Superior Provincial Park (38,000 camper nights and 180,000 user-days), 8 outpost camps and 3 lodges. Much of the summer pressure in the zone is from tourists and most of the winter pressure is from local residents. Logging will continue to progress into the zone in the next few years, and mining activity is extensive in the Mishibishu area.

Because of the higher quality angling and lower pressure in most of this zone at present, less intensive fisheries management will occur in this zone than in the Central Zone.

Objectives

The objectives for the zone are to enhance the remote, high quality, naturally reproducing brook trout and lake trout fisheries; and enhance the trout fisheries along road corridors to increase angling opportunities for trout. Retaining remote fisheries will maintain the diversity of angling opportunities in the District. This will provide high quality fisheries for local residents and attract tourism for the local economy. Improving fisheries in the Highway 17 corridor and the Bremner Road area will provide easily accessible fisheries for local anglers and tourists.

The specific objectives for the zone are to:

- implement the regulations and policies required to protect and enhance the remote and road corridor fisheries.

- manage all of the approximately 25 lakes and ponds along the Highway 17 corridor in Lake Superior Provincial Park to increase the number and quality of angling opportunities in this easily accessible area.

- manage 5 lakes in the Bremner area to increase the number and quality of angling opportunities in this easily accessible area.

- establish trout populations in 5 additional lakes away from road access (4 brook trout, 1 lake trout) to increase opportunities for more remote trout angling.

- establish trophy fisheries in 3 lakes (2 brook trout, 1 lake trout).

- maintain existing remote tourism operations and consider limited additional tourism development.

Problems

Based on some creel census data and many angler checks and reports, angler harvest is thought to be the main factor affecting angling quality in the zone. Because of the small size and low productivity of most of the waters, it takes very little angling pressure to reduce the trout populations - resulting in lower catch rates and smaller fish. This problem is most noticeable on newly accessed lakes where fishing pressure and quality are very high for a short period but then decline to low levels. Therefore, harvest management is needed to protect or improve angling quality on many waters in the zone.

Some waters in the zone could provide more sportfish production but are lacking brook trout or lake trout. The introduction of fish species which compete with or prey upon trout is also a problem in this zone. Yellow perch introductions are particularly serious - virtually eliminating brook trout production. Similarly, brook trout do not co-exist well with pike. The introduction of minnows also reduces brook trout production. This problem is most prevalent along the highway corridor in Lake Superior Provincial Park but is likely to occur in any accessible area. Although not as widespread as over-harvesting, introductions may be more serious because they are difficult or impossible to correct. Competition and predation from other indigenous species (whitefish, suckers, ling) may also be reducing trout production in some lakes.

Habitat problems may exist in some waters in the zone. There may be a lack of spawning areas in some lakes. Acid precipitation may be reducing productivity in some areas. Winter oxygen depletion may be a problem in some small lakes. Also, siltation, physical disturbance, and chemical pollution from roads, logging, and mining may have damaged habitat in specific locations. Although important in specific areas, habitat problems are not widespread.

Remote access is perhaps the main issue among users in this zone. Many anglers, tourist outfitters, and park users want to retain the remote wilderness nature of the area. Other anglers, tourist businesses, logging and mining companies want easy access to the area.

Fisheries Management Actions

1. **Assessment**

   - angler survey - to assess fish stocks, harvest, and angling quality throughout the zone, including stocked lakes.

- lake and stream surveys - to collect habitat and fisheries information:
  - lakes with perceived problems (Fenton, Henry, Rabbit Blanket, Red Rock, Mom, Dad, Doc Greig, Kenny).
  - waters with potential for introductions or stocking (Bremner Road area, Hwy 17 corridor, other lakes with no information).
  - all trout lakes in order of size.

- habitat surveys - on major trout lakes and suspected problem areas to identify habitat for improvement.

- calculate potential yields - of trout on all lakes with tourist facilities, using the morphoedaphic index (MEI). Estimates of allowable harvest and pressure will help tourist operators manage their operations.

2. **Harvest management**

- standard Provincial regulations - will be used to control harvest in most of the zone. The Provincial lake trout regulations are currently under review. Shorter seasons, size limits, lower catch limits, and other techniques are being considered to protect lake trout. Review of the brook trout regulations may follow. Until these reviews are complete complete, the regulations will remain the same on most waters.

- special trophy regulations - are proposed for 3 lakes in the zone to maintain exceptionally high quality angling.

  lake trout - Mijinemungshing Lake - catch limit of 2, only 1 greater than 40 cm, only 1 less than 40 cm, artifical bait only.

  brook trout - Maquon and One-Island Lakes - catch limit of 2, only 1 greater than 40 cm, only 1 less than 40 cm, artifical bait only.

- information - to gain support for management, keep anglers informed about limited fisheries productivity, purpose and results of regulations, and proper release techniques. Sign all lakes with special regulations.

- sanctuary - Pipe Lake - to protect stock for walleye transfers.

- enforcement - schedule 10% of fisheries field enforcement in the District on the zone to ensure compliance with the regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone numbers.

3. **Fish community management**

- introductions - to establish self-sustaining trout populations by transferring adult fish or stocking hatchery fish.

  lake trout - Jarvey, Belanger, Kwagama, MacGregor, Red Rock.

  brook trout - to lakes as identified (particularly near Highway 17 and Bremner Road corridors).

Other species will not be introduced in this zone. Splake are lake trout - brook trout hybrids and will be used for stocking.

- stocking - to maintain trout populations in accessible areas where reproduction is limiting:

  - brook trout - lakes near Hwy 17 and Bremner Rd. corridor (Mom, Dad, Baby, Colette, Orphan, Doc Greig, Crescent, Mudhole).
  - splake - lakes with perch (Noisy, Fenton, Rabbit Blanket, Red Rock, Broadtail, Peat).

- live baitfish prohibition - expand baitfish ban to Pawis, Noganosh, Tabobondung, Sampson, Roy, Restoule, Redsky, Suganaqueb, Beaudin, Cannard, Bullock, Grootenboer, Larson and Labonte Townships to prevent the introduction of perch and minnows into trout lakes.

- lake reclamation - could be considered where introductions of perch or other species have reduced trout production. Fish toxins, explosives, netting, water level manipulations, or large predators could be used. Use of this technique will be limited as class environmental assessment is being prepared. Small lakes along Highway 17 corridor are candidates.

- reduce competition and predation - reducting under-used fish such as suckers and burbot may improve trout survival. Increasing the number of large trout may also reduce these other species. Possible projects for groups.

4. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M, MOT, ACR). Guidelines for logging, road construction, mining, and other development near waters will continue to be applied.

- information - inform land and water users about fish habitat and regulations to promote protection. Provide guidelines and prepare a brochure outlining habitat protection for all activities near water.

- spawning areas - improve existing areas or create new areas if reproduction is limiting. Stocked lakes along Hwy 17 are possible candidates. Possible group projects.

- nursery and adult habitat - add cover such as vegetation, trees, boulders, or depth. Many candidates. Possible group projects.

- reduce siltation - stabilize eroding crossings and banks. Remove silt from pools and riffles. Possible group projects.

- reduce contaminants - direct highway runoff away from lakes to prevent salt accumulation. Mom and Dad Lakes may be candidates but assessment is needed. Work with other agencies (MOE, Federal Government) to reduce acid emissions.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again, and inform anglers of proper release techniques.

- redirect pressure to other areas - improve fisheries in more accessible areas to divert pressure and help maintain the remote, high quality fisheries of the zone.

- redirect pressure to under-used species - inform anglers where and how to catch whitefish and perch.

- viewing - provide information on viewing spawning runs of fish.

- signs - provide lake name and fish species signs for all stocked lakes and a variety of highway corridor lakes to encourage use.

- road management - in conjunction with MOT and Park Plans, improve parking and access to lakes along Highway 17 corridor. Locate other roads at least 120 m, and preferably more than 250 m, from all trout waters to prevent road access campsites, and retain remote nature of zone. Vehicle access will continue to be controlled in Lake Superior Provincial Park. Most other roads in the zone will be open to vehicle travel. Some lakes with remote tourist operations may require additional protection to maintain the remote component of the tourist industry and provide this type of angling opportunity.

- boat caches - could be controlled on specific problem lakes to maintain a remote high quality fishery. Not allowed in Parks.

- cottage development - is not proposed on Crown Land at present. This will help retain the remote, high quality nature of the zone.

- tourist development - limited expansion of the tourist industry will be considered where conflicts with other users are minimized and where the fishery can support additional pressure. Special controls to protect the fishery may be required.

- reduce conflicts - see discussion under Outlying Zone.

- upgrade tourist camps - see discussion under Outlying Zone.

ZONE 4. ACID SENSITIVE ZONE

There are two extensive areas in the Wawa District which are extremely sensitive to acid precipitation. Together they total 1800 km or 8% of the District, excluding Lake Superior. One area includes the lower portion of the Montreal River watershed in the south end of the District. The other area lies west of Wawa towards Pukaskwa National Park.

The pH of the waters in these areas is below 6 and often below 5, and alkalinity is very low or non-existent. The areas are particularly susceptible to acidification because of granitic bedrock and shallow soils with low buffering capacity. The small volume and watersheds of many of the lakes may also accentuate the problem. Resident lake trout stocks have already been lost because of acidification in Marjorie and Molybdenite Lakes west of Wawa; and Grey Owl and Barbara Lakes, south of the Montreal River cannot support lake trout. Native brook trout fisheries in Black Beaver, Kwagama, Little Agawa, Jackfish, and Missing Lakes also appear to be displaying varying degrees of acid related stress. Acid related problems with fish production threaten the already limited tourist industry, and have eliminated or damaged fisheries in a large number of lakes accessible to local residents. The lost recreational and economic values from deteriorated fisheries in the area are substantial. At present, the extent of the problem in the acid sensitive areas is not widely recognized because of limited access to these areas.

Objectives

The objectives are to: use the area to provide information for use in reducing acid emissions; and conduct experimental rehabilitation of fisheries eliminated or degraded by acidification. If successful, this would create new fisheries accessible to local residents, and provide information for managing other lakes in this zone. Large scale management is not proposed for this zone because of the remote nature of this zone and the extent of the acidification problem.

The specific objectives for the zone are to:

- summarize the biological and economic information on the degradation of fisheries in the zone and provide to agencies responsible for reducing acid emissions (MOE, Federal Government).

- experimentally re-establish fisheries in 2 lakes which have lost their sportfish. Lake trout could be tried in Molybdenite Lake west of Wawa and brook trout in Roi Lake south of Montreal Falls.

- attract a research group to conduct experimental studies on the rehabilitation of fisheries degraded by acidification.

Problems

The major problem in this zone is habitat degradation from acidification. Exploitation, other habitat problems, and user conflicts have incidental or minor impacts. To control the sources of acid precipitation will require international action, and may not occur in the near future. It is also impossible to individually

rehabilitate the water quality or fish communities in all of the acid stressed waters in the zone. Therefore, fisheries management will be possible on only a few waters with high recreational and economic value. Because little information is available on the rehabilitation of acid stressed fisheries, management will be largely experimental.

Fisheries Management Actions

1. **Assessment**

   - monitor the water quality and fish stock status in accessible lakes and tourism lakes.

   - encourage similar monitoring work throughout the zone by other acidification research groups (MNR, MOE, DFO and universities).

   - prepare a summary report of all existing water chemistry, fisheries, and economic information on the degraded fisheries in the zone to quantify the effects of emissions in these areas.

2. **Fish community management**

   - stocking - experimentally stock a limited number of high priority lakes where reproduction has failed but adult habitat appears suitable. Lake trout could be planted in Molybdenite Lake west of Wawa and brook trout in Roi Lake south of Montreal Falls.

3. **Habitat management**

   - neutralization - the potential exists for limited experimental liming and assessment of lakes or spawning areas by research groups. However, study areas are already established elsewhere.

ZONE 5. INDIVIDUAL WATERBODY MANAGEMENT ZONE

ZONE 5A. WHITE LAKE

White Lake is located about 29 km northwest of White River. With a surface area of 6,018 ha (including Ravine Lake), it is the largest inland waterbody in Wawa District. Access is from Highway 17.

White Lake has a high quality walleye fishery. Pike, perch, and whitefish are also caught. The lake has maximum depth 48.8 m, mean depth 8.7 m, and total dissolved solids 76.3 mg/l. Ravine Lake has maximum depth 29.6 m, mean depth 10.2 m, and total dissolved solids 65.3 mg/l. The metric morphoedaphic indicies (MEI) for the lakes are 8.8 and 6.4 respectively. The total estimated potential yield of both lakes from MEI is 22357 kg of all species. In 1983, White Lake had moderate angling pressure of 6.4 hours/ha or 9615 angler-days, which is 5% of the District fishing pressure. Harvest was estimated at 9450 kg, or 7% of the District sportfish harvest. The angling harvests for all species were below estimated potential yields, but no estimate of the native fishery is available. The walleye catch rate was moderate but the pike catch rate was low, and the fish were generally small (mean fork length 34.3 and 57.1 cm respectively).

Developments on White Lake consist of the Pic-Mobert Indian Reserve (population 250-300), White Lake Provincial Park (187 campsites), the Marathon North Shore Boat Club (about 50 private trailers), 48 cottage lots, and a tourist operator boat cache. Additional cottage lots are proposed for the lake. The lake is drawn down about 1.5 m in winter for flood control and to prevent damage to the outflow dam.

Objectives

The objectives for fisheries management on White Lake are to harvest the major sportfish species (walleye and pike) at close to their natural maximum sustainable yield, provide for the native food fishery, maintain angling opportunities, and increase angling quality (size, catch rates, diversity) for local residents and tourists.

The specific objectives for White Lake are to:

- maintain angling pressure at about 9600 angler-days.

- harvest the estimated potential yield of about 7154 kg of walleye (1.19 kg/ha) (32% of the total potential yield), including the native harvest. Current angling harvest is estimated at 6240 kg.

- increase the number of angled walleye 40cm fork length and larger from about 1600 (1 per 6 angler-days) to 2400 (1 per 4 angler days).

- increase the walleye catch rate from about 0.63 to .80 fish caught/hour for walleye anglers.

- harvest the estimated potential yield of about 5589 kg of pike (0.93 kg/ha) (25% of total potential yield), including the native harvest. Current angling harvest is estimated at 2960 kg.

- increase the harvest of other species toward the estimated potential yield of 9614 kg (1.60 kg/ha) (43% of total potential yield), including native harvest. Angling harvest is now about 250 kg.

- establish a self-sustaining lake trout population in the lake.

Problems

The harvest of walleye from the angling and native fisheries on White Lake is estimated to be close to, or in excess of, the potential yield. The 1983 catch rate for walleye was moderate and mean size was small, indicating heavy exploitation. Angling pressure was well below the 10 hours/ha considered to be the upper limit for a quality fishery, but this does not account for the native fishery. Pike are apparently being harvested well below their estimated potential yield. However, catch rates and mean size of pike were low and declining, indicating heavy exploitation. Therefore, to improve angling quality the harvest of walleye and pike must be reduced.

A large part of the potential yield of White Lake is in under-used species such as perch and whitefish. These species could replace reductions in the harvest of pike and walleye, if pressure can be diverted to them. The sport fishery would also benefit if the native fishery could be directed at these species. Large stocks of under-used species may also be competing with or predating on sportfish. The importance of these interactions is thought to be less than angling harvest. A large part of the lake is suitable for lake trout and could provide additional fish production if this species was present.

Water fluctuations may be affecting fish production on White Lake by exposing spawning areas and reducing aquatic invertebrates and vegetation which are important food and cover for fish. The impact of on fish production could be significant, because as much as 10 to 20% of the lake bottom may be dewatered in winter. Habitat degradation from shoreline development may also be a minor problem at some locations. There may also be natural deficiencies in habitat in some locations, for example, lack of cover.

User conflicts on the lake are perceived between anglers and natives, and between residents and non-residents.

Fisheries Management Actions

1. **Assessment**

   - angler survey - detailed summer survey to assess quality of fishery, every 5 to 10 years.

   - native fishery survey - determine native subsistence harvest.

   - tagging study - to estimate walleye population size and structure, and refine potential yield estimates.

   - habitat survey - to evaluate spawning, nursery, and adult habitat, particularly in relation to water drawdowns.

2. **Harvest management**

- standard Provincial regulations - will be used for most harvest management on White Lake. A review of the Provincial walleye regulations may occur in the future. However, because of the importance of White Lake, special regulations are proposed to enhance the walleye fishery immediately.

- special lake-specific regulations - are designed to increase the number and size of fish. Anglers will catch fish more often and larger fish will be caught, but not all fish can be kept.

  walleye - slot size limit, fish from 36 to 43 cm total length to be released. This will help protect first major spawning year class and increase number of larger fish.

  pike - special regulations for pike may be proposed after walleye population has been improved.

  Because these regulations are experimental, the fishery will be assessed at intervals and the regulations may be altered. For example, if too few walleye reach the slot, it may be necessary to limit the number caught below the slot.

- sanctuaries - to protect spawning concentrations of walleye at Shabotik Bay and White River at Mobert from 15 March to 15 June.

- information - to gain support for management, keep lake users informed about limited fisheries productivity, purpose of regulations, implementation and results of the special regulations, and proper techniques for releasing fish.

- enforcement - schedule 5% of fisheries field enforcement in the District on White Lake to ensure compliance with regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

3. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M). Guidelines on logging, road construction, mining, and other development will continue to be applied.

- information - educate users of the lake and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for protecting fish habitat.

- optimize water levels - develop a method to optimize water levels for fisheries, flood control, and other uses. Consider replacing or eliminating dam.

- improve spawning areas - clean or improve substrate in existing spawning areas or create new spawning areas, taking into account water fluctuations. Possible group projects.

- improve nursery and adult habitat - add cover such as structures, trees, or vegetation, or stabilize water levels in bays. Possible group projects.

4. **Fish community management**

- introductions - establish self-sustaining lake trout populations in Ravine and White Lakes to increase angling opportunities.

- reduce competition and predation - reducing under-used species such as suckers and burbot may improve sportfish survival. Increasing the numbers of large sportfish may also reduce these other species. Possible group project.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again, and inform anglers of proper release techniques.

- redirect pressure to under-used species - inform anglers where and how to catch whitefish and perch.

- redirect pressure to other areas - improve nearby fisheries to reduce pressure on White Lake.

- cottage and tourist development - will be considered based on fishery status and other lake users. Such development may result in a decline in angling quality. Additional controls may be considered to protect the fishery.

- native fishery - regulate angling harvest to allow for subsistence use. Encourage natives to obtain more revenue from fish resource through tourist services instead of subsistence fishing. Encourage food fishery for under-used species.

- reduce conflicts - inform lake users about the size and value of the sportfishery and native food fishery to promote acceptance of both. Encourage joint projects to improve fisheries.

ZONE 5B. ESNAGI LAKE

Esnagi Lake is located about 65 km north-northeast of Wawa. With a surface area of 4586 ha, it is the third largest inland lake in Wawa District and the largest lake in the Magpie River watershed. Access to the lake is by air, by the CPR from Chapleau or White River, by portage from the Magpie River, and by snowmobile during the winter.

The lake has a high quality walleye and pike fishery. Some perch and whitefish are also caught. The lake has maximum depth 22.9 m, mean depth 4.7 m, total dissolved solids 47.6 mg/l, and metric morphoedaphic index (MEI) 10.13. The estimated potential yield of the lake from the MEI is 18200 kg of all species. The lake has heavy angling pressure of about at 9.1 hrs/ha or 10400 angler-days, which is about 5% of the total District pressure. Harvest is estimated at 17100 kg, or about 12% of the District sportfish harvest. Walleye and pike are being harvested above their estimated potential yield. Catch rates were good for walleye and moderate for pike in 1982, mean sizes were small (36.8 and 61.2 cm fork length respectively).

The lake has 3 tourist lodges, 2 outpost camps, 2 private cottages, and 1 trappers cabin. About 90% of the fishing pressure on the lake is from the tourist industry. The lake will also become a reservoir for the Magpie River hydro project, with a winter drawdown of 0.9 m.

Objectives

The objectives for fisheries management on Esnagi Lake are to harvest the major sportfish (walleye and pike) at close to their natural maximum sustainable yield, maintain the existing remote angling opportunities on the lake, and increase angling quality (size and catch rates) for the tourist industry and local residents.

The specific objectives for Esnagi Lake are to:

- maintain total fishing pressure at about 10400 angler days.

- decrease the walleye harvest from about 9385 kg (2.05 kg/ha) to the estimated potential yield of 5820 kg (1.15 kg/ha) (32% of total potential yield).

- increase the number of angled walleye 40 cm fork length and larger from about 1800 (1 per 6 angler-days) to 2600 (1 per 4 angler-days).

- increase the walleye catch rate from about 1.25 fish caught/hour to 1.50 fish caught/hour for walleye anglers.

- decrease the pike harvest from about 7017 kg (1.53 kg/ha) to the estimated potential yield of 4550 kg (1.0 kg/ha) (25% of total potential yield).

- increase harvest of other species, particularly whitefish and perch, from about 483 kg towards the estimated potential yield of 7830 kg (43% of total potential yield).

Problems

The present harvest on Esnagi Lake exceeds the estimated potential yield for walleye by 61% and pike by 54%. The age structure of these species in the harvest shows few large fish - indicating heavy exploitation. Catch rates are acceptable at present, but total pressure is close to 10 angler-hours/ha which is considered to be the upper limit for maintaining a quality walleye fishery. Consequently, existing exploitation is showing signs of limiting the quality of the fishery. Therefore, to improve the quality of angling, it will be necessary to reduce the harvest of walleye and pike.

A large part of the potential yield of Esnagi Lake is in under-used species such as whitefish and perch. These species could replace any reductions in the harvest of walleye and pike, if pressure can be diverted to them. Large stocks of under-used fish may also be competing with or predating on sportfish. The importance of these interactions is thought to be less than angling harvest.

Water drawdowns for hydro power and flood control may affect fish production by exposing spawning areas, and reducing aquatic invertebrates and vegetation which are important food and cover for fish. The impact on fish production could be significant, because as much as 10 to 20% of the lake bottom may be dewatered in winter. There may also be natural habitat deficiencies in some locations, for example, lack of cover.

The main user conflict on Esnagi Lake is between the tourist operators and the local residents over access to the lake. Possible increase in access from logging is part of this issue. A conflict between power generation and fisheries also exists.

Fisheries Management Actions

1. **Assessment**

   - angler survey - detailed summer survey to assess quality of fishery, every 5 to 10 years; winter survey to obtain information on ice fishery, in conjunction with summer survey.

   - tagging study - to estimate walleye population size and structure and refine potential yield estimates.

   - habitat survey - to evaluate spawning, nursery, and adult habitat, particularly in relation to water drawdowns.

   - assess water fluctuations - conduct assessment work specified in terms and conditions of Magpie River Hydro Project Agreement.

2. **Harvest management**

   - standard Provincial regulations - will be used for most harvest management on Esnagi Lake. A review of the Provincial walleye regulations may occur in the near future. However, because of the importance of Esnagi Lake, special regulations are proposed to enhance the walleye fishery immediately.

- special lake-specific regulations - are designed to increase the number and size of fish. Anglers will catch fish more often and larger fish will be caught, but not all fish can be kept.

  walleye - slot size limit, fish from 36 to 43 cm total length to be released. This will help protect first major spawning year class and increase number of larger fish.

  pike - special regulations for pike may be proposed after walleye population has been improved.

  Because these regulations are experimental, the fishery will be assessed at intervals and the regulations may be altered. For example, if too few walleye reach the slot, it may be necessary to limit the number caught below the slot.

- sanctuaries - to protect spawning concentrations of walleye at Magpie River and part of Mosambik Bay, and Medhurst Creek, from 15 March to 15 June.

- information - to gain support for management, keep lake users informed about limited fisheries productivity, purpose of regulations, implementation and results of the special regulations, and proper techniques for releasing fish.

- enforcement - schedule 5% of fisheries field enforcement in the District on Esnagi Lake to ensure compliance with regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

3. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M). Guidelines for timber harvesting, road construction, mining, and other development near the lake will continue to be applied.

- information - educate users of the lake and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for protecting fish habitat.

- mitigate possible losses from the Magpie power development - if a significant negative change in the fishery occurs.

- improve spawning areas - clean or improve substrate in existing spawning areas or create new spawning areas, taking into account water fluctuations. Possible group projects.

- improve nursery and adult habitat - add cover in suitable areas or stabilize water levels in bays. Structures, trees, or vegetation could be used for cover. Possible group projects.

4. **Fish community management**

- reduce competition and predation - reducing under-used species such as suckers and burbot may improve sportfish survival. Increasing the number of large sportfish may also reduce these other species. Possible group project.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again and inform anglers of proper release techniques.

- redirect pressure to other species - inform anglers how to catch and prepare whitefish and perch to increase angling opportunities and reduce pressure on walleye and pike.

- redirect pressure to other areas - improve nearby fisheries to provide alternative angling opportunities and reduce pressure on Esnagi Lake. Introduce brook trout to Merekeme Lake if suitable. Improve fisheries near Dubreuilville (see Zone 1).

- access - prevent road access to Esnagi to retain remoteness.

- boat caches - could be controlled to reduce pressure.

- cottage development - should not occur, to retain remote nature of lake and limit pressure.

- tourist development - discourage additional tourist development to allow existing operations to provide high quality fishing.

- enhance tourist services - encourage operators to improve their services and facilities to obtain more revenue with less consumption of the resource. Fish harvest can be reduced by American plan meal systems and by providing other meats for shore lunches and other meals. Facilities (such as screened porches, fireplaces, saunas, and lounges) and other activities (such as wildlife viewing, hiking, shuffleboard, etc.) increase tourism value and may also reduce fish harvest.

- reduce conflicts - inform the public about the operation and benefits of the local tourist industry to promote acceptance of tourism by local anglers. Encourage tourist operators to offer special packages to local residents to promote acceptance of their industry. Encourage joint projects to improve fisheries.

ZONE 5C. OBA LAKE

Oba Lake is located about 80 km northeast of Wawa. Based on its surface area of 2457 ha, it is the sixth largest inland waterbody in Wawa District. Access to the lake is by air or by the ACR between Hawk Junction and Hearst. During the winter snowmobiles are used.

Oba Lake has a high quality walleye, pike, and perch fishery. Whitefish and herring are also caught. Oba Lake has a maximum depth of 13.1 m, a mean depth of 3.9 m, total dissolved solids of 56.5 mg/l, and a metric morphoedaphic index (MEI) of 14.5. The total estimated potential yield of the lake based on the MEI is 11460 kg of all species. In 1985, Oba Lake had heavy angling pressure at about 10.9 hours/ha or 6700 angler-days, which is about 3% of the total pressure in the District. The 1985 harvest was estimated at 9330 kg or 6.6% of the District sportfish harvest. Pike were harvested well above their estimated potential and walleye were harvested at close to their potential. Catch rates were moderate, but fish were generally small (mean fork length was 33.7 cm for walleye and 53.7 cm for pike).

The lake has 3 tourist camps and 6 private cottages. About 90% of the fishing pressure on the lake is from tourist lodge clientele.

Objectives

The objectives for fisheries management on Oba Lake are to harvest the major sportfish (walleye, pike, and perch) at close to their natural maximum sustainable yield, maintain the existing remote angling opportunities on the lake, and increase angling quality (size and catch rates) for the tourist industry and local residents.

The specific objectives for Oba Lake are to:

- maintain total fishing pressure at about 6700 angler-days.
- maintain the walleye harvest at its present level which is close to the estimated potential yield of 3670 kg (1.49 kg/ha) (32% of total potential yield).
- increase the number of angled walleye 40 cm fork length and larger from about 475 (1 per 14 angler-days) to 1120 (1 per 6 angler-days).
- increase the walleye catch rate from about 0.65 to 1.00 fish caught/hour for walleye anglers.
- decrease the pike harvest from about 4400 kg (1.79 kg/ha) to the estimated potential yield of 2865 kg (1.17 kg/ha) (25% of total potential yield).
- increase harvest of other species, particularly whitefish and perch, from about 1130 kg towards the estimated potential yield of 4925 kg (43% of total potential yield).

Problems

At present, on Oba Lake, pike are being harvested at 54% above their estimated potential yield and walleye are being harvested at about their estimated potential yield. In addition, the angling pressure of 11 hours/ha is above the recommended maximum of 10 hours/ha for a high quality fishery. This heavy pressure is reflected by the low numbers of large fish caught and moderate catch rates. To improve angling quality for walleye and pike, it will be necessary to control harvest to allow the numbers and size of fish to increase.

A large part of the potential yield of the lake is in under-used species such as perch, whitefish, and herring. These species could replace reductions in the harvest of pike and walleye, if pressure can be diverted to them. These large stocks of under-used fish may be competing with or predating on sportfish. The importance of these interactions is thought to be less than angling harvest.

Habitat degradation from shoreline development may be a minor problem at some locations on the lake. There may also be natural deficiencies in habitat in some locations, for example, debris in spawning streams or lack of cover.

A user conflict exists between the tourist operators and the local residents and the logging industry. This conflict centres on the proposed logging road between Esnagi Lake and Oba Lake. If access was left uncontrolled, the road could facilitate access to the lake by boat or all terrain vehicles.

Fisheries Management Actions

1. **Assessment**

   - angler survey - detailed summer survey to assess quality of fishery, every 5 to 10 years.

   - tagging study - to estimate walleye population size and structure and refine potential yield estimates.

   - habitat survey - to evaluate spawning, nursery, and adult habitat.

2. **Harvest management**

   - standard Provincial regulations - will be used for most harvest management on Oba Lake. A review of the Provincial walleye regulations may occur in the future. However, because of the importance of Oba Lake, special lake-specific regulations are proposed to enhance the walleye fishery immediately.

   - special lake-specific regulations - are designed to increase the number and size of fish. Anglers will catch fish more often and larger fish will be caught, but not all fish can be kept.

     walleye - slot size limit, fish from 36 to 43 cm total length to be released. This will help protect first major spawning year class and increase number of larger fish.

pike - special regulations for pike may be proposed after walleye population has been improved.

Because these regulations are experimental, the fishery will be assessed at intervals and the regulations may be altered. For example, if too few walleye reach the slot it may be necessary to limit the number caught below the slot.

- sanctuaries - to protect spawning concentrations of fish. For walleye at Tatnall River and pike at Whiteberry Creek, from 15 March to 15 June. Maintain sanctuary at Hoodoo Bay.

- information - to gain support for management, keep lake users informed about limited fisheries productivity, purpose of regulations, implementation and results of the special regulations, and proper techniques for releasing fish.

- enforcement - schedule 3% of the fisheries field enforcement in the District on Oba Lake to ensure compliance with regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

3. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M, ACR). Guidelines for logging, road construction, and other development near Oba Lake will continue to be applied.

- information - educate users of the lake and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for protecting fish habitat.

- improve spawning areas - clean or improve substrate in existing spawning areas or create new spawning areas. Possible group projects.

- improve nursery and adult habitat - add cover in suitable areas. Structures, trees or vegetation could be used for cover. Possible group projects.

4. **Fish community management**

- reduce competition and predation - reducing under-used species such as suckers and burbot may improve sportfish survival. Increasing the number of large sportfish may also reduce these other species. Possible group project.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again, and inform anglers of proper release techniques.

- redirect pressure to other species - inform anglers how to catch and prepare whitefish and perch to increase angling opportunities and reduce pressure on walleye and pike.

- redirect pressure to other areas - improve nearby fisheries to increase angling opportunities and reduce pressure on Oba Lake. Stock brook trout in Lakes 8N-9, 8N-10, 10N-45. Improve fisheries near Dubreuilville (see Zone 1).

- access - prevent road access to Oba Lake to retain remoteness.

- boat caches - could be controlled to reduce pressure.

- cottage development - discourage additional development to limit fishing pressure.

- tourist development - discourage additional development to allow existing operations to provide high quality fishing.

- enhance tourist services - encourage operators to improve their services and facilities to obtain more revenue with less consumption of the resource. Fish harvest can be reduced by American Plan meal systems and by providing other meats for shore lunches and other meals. Facilities (such as screened porches, fireplaces, saunas, and lounges) and other activities (such as wildlife viewing, hiking, shuffleboard, etc.) increase tourism value and may also reduce fish harvest.

- reduce conflicts - inform the public about the operation and benefits of the local tourist industry to promote acceptance of tourism by local anglers. Encourage tourist operators to offer special packages to local residents to promote acceptance of their industry. Encourage joint projects to improve fisheries.

ZONE 5D. WABATONGUSHI LAKE

Wabatongushi Lake is located about 60 km northeast of Wawa. With a surface area of 3791 ha, it is the fourth largest inland lake in Wawa District. Access is by air, by the ACR from Hawk Junction or by the CPR from White River or Missanabie. Roads from Dubreuilville go to the Narrows of the lake and to Lochalsh at the south end of the lake.

Wabatongushi Lake is recognized as a high quality walleye, pike, and perch fishery. Some whitefish and herring are also caught. The lake has maximum depth 53.4 m, mean depth 7.2 m, total dissolved solids 56.5 mg/l, and metric morphoedaphic index (MEI) 7.85. The estimated potential yield of the lake from the MEI is 13410 kg of all species. In 1984, the lake had very heavy angling pressure estimated at about 14.7 hours/ha or 13920 angler-days, which is about 7% of the District fishing pressure. The 1984 harvest was estimated at 11575 kg or about 8% of the sportfish harvest in the District. Walleye and pike are being harvested well above their estimated potential yield. The catch rate was moderate for walleye and low for pike in 1984, and mean sizes were small (32.3 cm and 51.9 cm fork length respectively).

The lake has 5 tourist lodges and 19 cottages. About 80% of the pressure on the lake is from tourist lodge clientele. The town of Dubreuilville (population 1100) is located about 30 km west of the lake. Crown Land camping by non-residents of Canada is not permitted in the vicinity of the lake. The lake is also a reservoir for the Michipicoten River hydro project, with present winter drawdowns up to 2.7 m.

Objectives

The objectives for fisheries management on Wabatongushi Lake are to harvest the major sportfish (walleye and pike) at close to their natural maximum sustainable yield, maintain the existing angling opportunities on the lake, and increase angling quality (size and catch rates) for the tourist industry and local residents.

The specific objectives for Wabatongushi Lake are to:

- maintain total fishing pressure at about 13410 angler days.
- decrease the walleye harvest from about 6100 kg (1.61 kg/ha) to the estimated potential yield of 4290 kg (1.13 kg/ha) (32% of total potential yield).
- increase number of angled walleye 40 cm fork length and larger from about 790 (1 per 17 angler-days) to 1340 (1 per 10 angler-days).
- increase walleye catch rate from 0.60 to 0.80 fish caught/hour for walleye anglers.
- decrease pike harvest from about 4360 kg (1.15 kg/ha) to estimated potential yield of 3352 kg (0.88 kg/ha) (25% of total potential yield).
- increase harvest of other species from 1100 kg toward the estimated potential yield of 5770 kg (43% of total potential yield).

- establish a self sustaining lake trout population in the lake.

Problems

The 1984 harvest on Wabatongushi Lake exceeded the estimated potential yield for walleye by 42% and pike by 30%. The age structure of these species in the harvest shows few large fish, catch rates are moderate or low, and the pressure of 14.7 angler-hours/ha far exceeds the 10 angler-hours/ha considered to be the upper limit for a high quality walleye fishery. It appears that exploitation is the main factor limiting the quality of the fishery. To improve angling quality, it will be necessary to reduce the harvest of walleye and pike.

A large part of the potential yield of the lake is in under-used species such as perch, whitefish, and herring. These species could replace reductions in the harvest of walleye and pike, if pressure can be diverted to them. Large stocks of under-used fish may also be competing with or predating on sportfish. The importance of these interactions is thought to be less than angling harvest.

Winter drawdowns for hydro power may adversely affect fish production by exposing spawning areas and reducing aquatic invertebrates and vegetation which are important food and cover for fish. The impact on fish production could be significant, because as much as 10 to 20% of the lake bottom may be dewatered in winter. Habitat degradation from shoreline development may also be a minor problem at some locations. There may also be natural deficiencies in habitat in some locations, for example, lack of cover.

The main user conflict on the lake is between the tourist operators and road access users of the lake. This conflict is centered on the road at the Narrows which reduces the remoteness of the lake because of its visibility and easy access for boat launching. Also, the tourist operators do not wish to see any further cottage development on the lake as proposed in the 1983 District Land Use Guidelines.

Fisheries Management Actions

1. **Assessment**

   - angler survey - detailed summer survey to assess quality of fishery, every 5 to 10 years; winter survey to obtain information on ice fishery, in conjunction with summer survey.

   - tagging study - to estimate walleye population size and structure, and refine potential yield estimates.

   - habitat survey - to evaluate spawning, nursery, and adult habitat - particularly in relation to water drawdowns.

2. **Harvest management**

   - standard Provincial regulations - will be used for most harvest management on lake. A review of the Provincial walleye regulations may occur in the future. However, because of the importance of Wabatongushi Lake, special regulations are proposed to enhance the walleye fishery immediately.

- special lake-specific regulations - are designed to increase the number and size of fish. Anglers will catch fish more often and larger fish will be caught, but not all fish can be kept.

  walleye - slot size limit, fish from 34 to 41 cm total length to be released. This will help protect first major spawning year class and increase number of larger fish.

  pike - special regulations for pike may be proposed after walleye population has been improved.

  Because these regulations are experimental, the fishery will be assessed at intervals and the regulations may be altered. For example, if too few walleye reach the slot, it may be necessary to limit the number caught below the slot.

- sanctuaries - to protect spawning concentrations of walleye at Dibben Bay and Tie Bay from 15 March to 15 June. Maintain sanctuary at Narrows.

- information - to gain support for management, keep lake users informed about limited fisheries productivity, purpose of regulations, implementation and results of the special regulations, and proper techniques for releasing fish.

- enforcement - schedule 7% of fisheries field enforcement in the District on Wabatongushi to ensure compliance with regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

3. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M). Guidelines for timber harvesting, road construction, mining, and other development near the lake will continue to be applied.

- information - educate users of the lake and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for protecting fish habitat.

- water levels - optimize water levels for flood control, power, and fish production.

- improve spawning areas - clean or improve substrate in existing spawning areas or create new spawning areas, taking into account water fluctuations. Possible group projects.

- improve nursery and adult habitat - add cover in suitable areas or stabilize water levels in bays. Structures, trees, or vegetation could be used for cover. Possible group projects.

4. **Fish community management**

- reduce competition and predation - reducing under-used species such as suckers and burbot may improve sportfish survival. Increasing the numbers of large sportfish may also reduce these other species. Possible group project.

- introduction - establish a self sustaining lake trout population after walleye fishery is improved.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again and inform anglers of proper release techniques.

- redirect pressure to under-used species - inform anglers where and how to catch and prepare whitefish and perch.

- redirect pressure to other areas - improve nearby fisheries to reduce pressure on Wabatongushi. Stock brook trout nearby. Improve fisheries near Dubreuilville (see Zone 1).

- boat caches - could be controlled to reduce pressure.

- cottage development - reassess objective of additional cottage development considering fishery status and other lake users.

- tourist development - discourage additional tourist development to allow existing operations to provide high quality angling.

- enhance tourist services - encourage operators to improve their services and facilities to obtain more revenue with less consumption of the resource. Fish harvest can be reduced by American plan meal systems and by providing other meats for shore lunches and other meals. Facilities (such as screened porches, fireplaces, saunas, and lounges) and other activities (such as wildlife viewing, hiking, shuffleboard, etc.) increase tourism value and may also reduce fish harvest.

- reduce conflicts - inform the public about the operation and benefits of the local tourist industry to promote acceptance of tourism by local anglers. Encourage tourist operators to offer special packages to local residents to promote acceptance of their industry. Encourage joint projects to improve fisheries.

ZONE 5E. DOG LAKE

Dog Lake is located about 60 km northeast of Wawa. Based on its surface area of 5182 hectares, Dog Lake is the second largest inland waterbody in Wawa District and the largest lake in the Michipicoten River watershed. Access to the lake is by Hwy. 651 north from Hwy. 101 or by the Canadian Pacific Railway from Chapleau or White River.

Dog Lake is mainly a walleye, pike, lake trout, and perch fishery. Some whitefish and smallmouth bass are also caught. It has maximum depth 74.7 m, mean depth 12.6 m, total dissolved solids 69.8 mg/l, and metric morphoedaphic index (MEI) 5.54. The total estimated potential yield, based on the MEI is 15677 kg of all species. In 1981, Dog Lake had heavy angling pressure estimated at 9.1 hours/ha or 11120 angler days, which is about 5% of the District fishing pressure. The 1981 harvest was estimated at 8700 kg, or about 4% of the sportfish harvest in the District. All species were harvested below their estimated potential. Catch rates were relatively low for all species, and mean size of walleye, pike and lake trout was small (35.6, 59.0, and 46.0 cm fork length respectively).

The town of Missanabie (population 250) is situated on Dog Lake. The lake also supports 7 tourist lodges, 4 outpost camps and 31 private cottages. About 75% of the pressure on the lake is from tourist lodge clientele. Approximately 80 additional cottages are proposed for the lake in the 1983 District Land Use Guidelines. Dog Lake is also a reservoir for the Michipicoten River hydro project, with present winter water drawdowns of up to 2.1 m.

Objectives

The objectives for fisheries management on Dog Lake are to harvest the major sport fish (walleye, pike, and lake trout) at close to their natural maximum sustainable yield, maintain the existing angling opportunities on the lake, and increase angling quality (size and catch rates) for the tourist industry and local residents.

The specific objectives for Dog Lake are to:

- maintain total fishing pressure at about 11120 angler-days.
- increase the walleye harvest from about 3330 kg (0.64 kg/ha) to the estimated potential yield of 3920 kg (0.76 kg/ha) (25% of total potential yield).
- increase the number of angled walleye 40 cm fork length and larger from about 730 (1 per 14 angler-days) to 1460 (1 per 7 angler-days).
- increase the walleye catch rate from about 0.38 to 0.60 fish caught/hour for walleye anglers.
- increase the pike harvest from about 2730 kg (0.53 kg/ha) to the estimated potential yield of 3135 kg (0.60 kg/ha) (20% of total potential yield).

- increase the lake trout harvest from about 2040 kg (0.39 kg/ha) to the estimated potential yield of 2350 kg (0.45 kg/ha) (15% of total potential yield).

- increase mean size of lake trout from about 46 to 50 cm fork length.

- increase the lake trout catch rate from about 0.13 to 0.20 fish caught/hour for lake trout anglers.

- increase harvest of other species, particularly whitefish and perch, from about 600 kg toward the estimated potential yield of about 6270 kg (40% of total potential yield).

Problems

The small size of fish and low catch rates on Dog Lake indicate heavy harvest. The pressure estimate of 9.1 angler-hours/ha is close to the 10 angler-hours/ha considered to be the upper limit for maintaining a high quality walleye fishery. Because the present sportfish harvest is below the estimated potential yield, it appears that heavy use has depressed sportfish populations in the lake. To allow the fish stocks to increase, harvest should be reduced. This will improve productivity, catch rates, and fish size.

A large part of the potential yield of the lake is in under-used species such as whitefish and perch. These species could replace reductions in the harvest of other species if pressure can be diverted to them. Large stocks of under-used fish may also be competing with or predating on sportfish. The importance of these interactions is thought to be less than angling harvest.

Winter drawdowns for hydro power may be adversely affecting fish production on the lake. Drawdowns may expose spawning areas, and reduce aquatic invertebrates and vegetation which are important food and cover for fish. The impact on fish production could be significant, because as much as 10 to 20% of the lake bottom may be dewatered in winter. Habitat degradation from shoreline development may also be a problem at some locations. There may also be natural deficiencies in habitat in some locations, for example, lack of cover.

Some user conflicts over the fish resource exist among residents, non-residents, and the tourist camps. A conflict also exists between the tourist camps and the proposed cottage development on the lake.

Fisheries Management Actions

1. **Assessment**

   - angler survey - detailed summer survey to assess quality of fishery, every 5 to 10 years; winter survey to obtain information on ice fishery, in conjunction with summer survey.

   - tagging study - to estimate walleye population size and structure, and refine potential yield estimates.

   - habitat survey - to evaluate spawning, nursery, and adult habitat - particularly in relation to water drawdowns.

2. **Harvest management**

- standard Provincial regulations - will be used for most harvest management on Dog Lake. The Provincial lake trout regulations are currently being reviewed, and a review of the Provincial walleye regulations may occur in the future. However, because of the importance of Dog Lake, special lake-specific regulations are proposed to enhance the fisheries for walleye and lake trout at this time.

- special lake-specific regulations - are designed to increase the number and size of fish. Anglers will catch fish more often and larger fish will be caught, but not all fish can be kept.

  walleye - slot size limit, fish from 36 to 43 cm total length to be released. This will help protect first major spawning year class and increase number of larger fish. Murray Lake will also be included.

  lake trout - catch limit of 2; only 1 less than 40 cm and only 1 greater than 40 cm; winter season from 15 February to 15 March and summer season from 3rd Saturday in May to 30 September. These changes will help protect recruitment of young fish and will also help maintain the numbers of larger fish.

  pike - special regulations for pike may be proposed after walleye and lake trout populations have been improved.

  Because these regulations are experimental, the fishery will be assessed at intervals and the regulations may be altered. For example, if too few walleye reach the slot, it may be necessary to limit the number caught below the slot.

- sanctuaries - to protect spawning concentrations of fish. For walleye at Dog River, McKee Creek, and Height of Land Bay from 15 March to 15 June. Maintain sanctuaries at Lochaish River and Bay, Bay 57 Narrows, and McMurty Narrows.

- information - to gain support for management, keep lake users informed about limited fisheries productivity, purpose of regulations, implementation and results of the special regulations, and proper techniques for releasing fish.

- enforcement - schedule 5% of fisheries field enforcement in the District on Dog Lake to ensure compliance with regulations. More enforcement time can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

3. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M, Local Services Board, CPR). Guidelines for logging, road, mining, and other development will continue to be applied.

- information - educate users of the lake and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for protecting fish habitat.

- optimize water levels - negotiate with Great Lakes Power to manage water levels to optimize power and fish production.

- improve spawning areas - clean or improve substrate in existing spawning areas or create new spawning areas, taking into account water fluctuations. Possible group projects.

- improve nursery and adult habitat - add cover in suitable areas or stabilize water levels in bays. Structures, trees or vegetation could be used for cover. Possible group projects.

4. **Fish community management**

- reduce competition and predation - reducing under-used species such as suckers and burbot may improve sportfish survival. Increasing the number of large sportfish may also reduce these other species. Possible group projects.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again, and inform anglers of proper release techniques.

- redirect pressure to other species - inform anglers how to catch and prepare whitefish and perch to increase angling opportunities and reduce pressure on other sportfish.

- redirect pressure to other areas - improve nearby fisheries to increase angling opportunities and reduce pressure on Dog Lake. Stock Souliere Lake with brook trout, improve other fisheries near Missanabie (see Zone 1).

- boat caches - could be controlled to reduce pressure.

- cottage development - determine amount of additional cottage development considering fishery status and other lake users.

- tourist development - discourage additional tourist development to allow existing operators to provide higher quality fishing.

- enhance tourist services - encourage operators to improve their services and facilities to obtain more revenue with less consumption of the resource. Fish harvest can be reduced by American plan meal systems and by providing other meats for shore lunches and other meals. Facilities (such as screened porches, fireplaces, saunas, and lounges) and other activities (such as wildlife viewing, hiking, shuffleboard, etc.) increase tourism value and may also reduce fish harvest.

- reduce conflicts - inform the public about the operation and benefits of the local tourist industry to promote acceptance of tourism by local anglers. Encourage tourist operators to offer special packages to local residents to promote acceptance of their industry. Encourage joint projects to improve fisheries.

ZONE 5F. MANITOWIK LAKE AND WHITEFISH LAKE

Manitowik and Whitefish Lakes are located about 35 km east of Wawa. At 1993 ha and 1883 ha they are the seventh and eighth largest inland waterbodies in Wawa District. Access to Whitefish Lake is by gravel road off Highway 101. Access to Manitowik Lake is by water from Whitefish Lake or by bush road from Hawk Junction to Blue Bay.

The lakes contain walleye, pike and lake trout. Whitefish, perch, and smallmouth bass are also caught. Manitowik Lake has maximum depth 119.0 m, mean depth 37.6 m, total dissolved solids 52.6 mg/l, and metric morphoedaphic index (MEI) of 1.40. Whitefish Lake has maximum depth 54.9 m, mean depth 15.2 m, and estimated metric MEI of 3.46. The total estimated potential yield of all species is 2920 kg for Manitowik and 4780 kg for Whitefish. In 1986, the lakes had moderate pressure estimated at 1.8 and 3.3 hours/ha or 920 and 1560 angler-days respectively, or about 1% of the District pressure. The harvest was estimated at 950 kg on Manitowik and 570 kg on Whitefish, or about 1% of the District harvest. All species were harvested below their estimated potential yield. Catch rates were low for lake trout and extremely low for walleye and pike, and mean sizes were small.

Whitefish Lake presently has 3 tourist lodges and 69 cottages. About 30% of the fishing pressure on the lakes is from tourist lodge clientele. There are 13 cottages and no tourist lodges on Manitowik Lake. Hawk Junction (population 300) lies 1 km west of the lakes. The lakes are also the main storage reservoirs of the Michipicoten River hydro development, with drawdowns of about 12.4 m.

Objectives

The objectives for fisheries management on Manitowik and Whitefish Lakes are to harvest the major sportfish (walleye, pike, and lake trout) at close to their natural maximum sustainable yield (see note), and to increase angling quality (size and catch rates) for local residents and the tourist industry.

The specific objectives for the lakes are to:

- increase walleye harvest from 434 (0.11 kg/ha) to 1000 kg (0.11 to 0.26 kg/ha).
- increase walleye catch rate from 0.10 to 0.20 fish caught/hour for walleye anglers.
- increase pike harvest from 211 (0.05 kg/ha) to 300 kg (0.08 kg/ha).
- increase lake trout harvest from 775 (0.20 kg/ha) to 1000 kg (0.26 kg/ha) (900 kg from Manitowik and 100 kg from Whitefish.
- increase lake trout mean size from 48.8 to 50.0 cm fork length.
- increase lake trout catch rate from 0.19 to 0.25 fish caught/hour for lake trout anglers.
- increase harvest of other species, particularly whitefish and perch, from about 100 towards 1500 kg.

Note: Actual potential yield of the lakes is estimated to be about half of the MEI predicted yield because of severe water drawdowns.

Problems

Low harvests, pressure, and catch rates for walleye and pike indicate low populations. The mean sizes of walleye and pike in the lakes are small, possibly indicating moderately heavy exploitation of the existing populations. However, because of the low harvests, exploitation does not appear to be the main factor responsible for the low populations. The low populations indicate poor survival of young fish, probably caused by severe winter water drawdowns. Drawdowns may limit spawning success, but probably have a greater affect on young fish by reducing aquatic invertebrates and vegetation which provide food and cover, or by dewatering shallow juvenile habitat.

In contrast, harvest, catch rate, and size of lake trout are fair to good in Manitowik - indicating a relatively healthy stock. Despite severe drawdowns, successful spawning occurs and young lake trout are surviving - possibly because they are less dependent on shallow areas than walleye or pike. However, overall lake trout yield is likely reduced because of the habitat reduction caused by the drawdowns. Maximum allowable lake trout yields are generally about 0.5 kg/ha. The 1986 harvest on Manitowik was about 0.39 kg/ha, and may be limited by drawdowns. However, it is thought that the lake trout harvest in Manitowik has been higher in the past, and this may have depressed the population. By controlling harvest, it may be possible to increase the lake trout population, harvest, catch rates, and fish size. The lake trout harvest and catch rate on Whitefish is very low. The stock is thought to be very small and limited by poor recruitment resulting from the water drawdowns. Because lake trout persist in Manitowik with similar drawdowns, there may simply be a lack of suitable spawning areas below the drawdown zone in Whitefish Lake.

Habitat degradation from shore development may occur on the lakes. There may also be some natural deficiencies in habitat, for example, lack of cover. But these problems are minor compared to drawdowns.

A large portion of the potential yield of the lakes is in under-used species such as whitefish and perch. These species could provide higher catches, if pressure can be diverted to them. These under-used species may also compete with or predate on sportfish, but these interactions are thought to be much less important than drawdowns.

The major user conflict on the lakes is between power and fish production. Some conflict also exists among local residents, tourist operators, and non-residents over the use of the fish resource.

Fisheries Management Actions

1. **Assessment**

   - angler survey - summer survey to assess quality of fishery, every 5 to 10 years; winter survey to obtain information on ice fishery, in conjunction with summer survey.

- capture study - to assess reproductive success and survival of young of all species, and determine habitat use.

- habitat survey - to evaluate spawning, nursery, and adult habitat - in relation to water drawdowns.

2. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M, ACR). Guidelines for logging, road construction, mining, and other development near water will continue to be applied.

- information - educate users of the lake and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for protecting fish habitat.

- water levels - optimize water levels for flood control, power, and fish production.

- spawning areas - improve existing spawning areas or create new spawning areas, considering water fluctuations. Create lake trout spawning bed in Whitefish Lake below 12 m and where sedimentation is not a problem. Possible group projects.

- nursery and adult habitat - add cover in suitable areas, or stabilize water levels in bays. Structures, trees, or rafts could be used for cover. Possible group projects.

3. **Harvest management**

- standard Provincial regulations - are the basis for harvest management on the lakes. The Provincial lake trout regulations are currently being reviewed, and a review of the Provincial walleye regulations may occur. Most regulations will remain the same until these reviews are complete.

- special lake-specific regulations - similar to Dog Lake could be used to increase number and size of lake trout and walleye. Will be considered if results from Dog Lake are successful.

- sanctuaries - to protect spawning concentrations of walleye at Shikwamkwa River, Boisey Creek, Hawk River, Goudreau Creek, and Big Stoney Rapids from 15 March to 15 June.

- information - to gain support for management, keep lake users informed about limited fisheries productivity, purpose of regulations, and implementation and results of regulations.

- enforcement - schedule 1% of fisheries field enforcement in the District on Whitefish and Manitowik to ensure compliance with regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

4. **Fish community management**

- stocking - of walleye fry may provide additional recruitment, but only if spawning is limiting and cannot be increased. Possible group project. Deep or river spawning lake trout could be stocked in Whitefish Lake to establish a population.

- reduce competition and predation - reducing under-used species such as suckers and burbot may improve sportfish survival. Increasing the numbers of large sportfish may also reduce these other species. Possible group project.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again, and inform anglers of proper release techniques.

- redirect pressure to other species - inform anglers where and how to catch whitefish and perch.

- redirect pressure to other areas - improve nearby fisheries and establish brook trout and walleye fisheries nearby (see Zone 1).

- cottage and tourist development - any development on Crown Land will consider status of fishery and other users.

- enhance tourist services - encourage operators to improve their services and facilities to obtain more revenue with less dependance on the fish resource. American plan meal systems, facilities (screened porches, fireplaces, saunas, and lounges), and other activities (wildlife viewing, hiking, games, etc.) increase tourism value and may also reduce fish harvest.

- reduce conflicts - inform the public about the operation and benefits of the local tourist industry to promote acceptance of tourism by local anglers. Encourage tourist operators to offer special packages to local residents to promote acceptance of their industry. Encourage joint projects to improve fisheries.

ZONE 5G. MONTREAL RIVER

Montreal River is located about 115 km south of Wawa. It consists of 4 reservoirs: Lower Falls (30 ha), Hogg (104 ha), Gartshore (333 ha), and Upper Falls (3216 ha). Based on the total surface area of 3,683 ha, the Montreal River system is the fifth largest inland waterbody in the Wawa District. The Upper Reservoir and Gartshore headpond are accessible from the Algoma Central Railway and by air. Road access to the reservoirs is restricted by Great Lakes Power Ltd.

At present, the Montreal River system contains walleye and northern pike, as well as whitefish and perch. The short stretch of river between the Lower Falls generating station and the mouth has a moderate spawning run of lake trout, and smaller runs of rainbow trout, salmon, and walleye (these fisheries are covered in the Lake Superior section). The Upper Falls headpond has a maximum depth of 76.0 m, a mean depth of 14.4 m, total dissolved solids (TDS) of 53.0 mg/l, a metric morphoedaphic index (MEI) of 3.68, and an estimated potential fish yield of 8100 kg of all species. The Gartshore headpond has a maximum depth of 29.9 m, a mean depth of 11.6 m, TDS of 36.2 mg/l, a metric MEI of 3.12, and an estimated potential yield of 780 kg. The Hogg headpond has a maximum depth of 34.6 m, a mean depth of 5.7 m, TDS of 46.5 mg/l, a metric MEI of 8.16, and an estimated potential yield of 370 kg. No potential yield estimates are available for the Lower Falls headpond. No quantitative information on harvest, angling pressure, or the fish populations is available, but angling is rated as only moderate to poor, despite low pressure and harvest.

The Montreal system currently has 2 tourist camps at the mouth of the river, and 2 tourist camps, 7 outpost cabins and 5 private cottages on the Upper Falls reservoir. The communities of Montreal River Harbour and Montreal Falls (pop 45) are also located on the system. The reservoirs also store water for the hydro plants on the river and have winter drawdowns of as much as 20 m in the Upper Reservoir.

Objectives

The objectives for fisheries management on the Montreal River system are to increase the production of sportfish and increase angling quality (catch rates, size, and species diversity) for the local residents and the tourist industry.

The specific objectives for the Montreal River system are to:

- assess angling harvest, fish stocks, and habitat to determine the present state of fishery and factors limiting production.

- set quantifiable and realistic objectives for sportfish production and angling quality.

- identify and implement management actions which will achieve the objectives.

Problems

The fisheries problems on the Montreal River system are thought to be primarily habitat related. The Upper Falls reservoir currently has winter drawdowns of up to 20 m with an average drawdown of 12 m. The other reservoirs also have periodic drawdowns to facilitate maintenance. The drawdowns may affect access to spawning areas and spawning success, dewater shallow nursery and juvenile habitat, and reduce the volume of habitat for all fish. The water fluctuations also reduce aquatic invertebrates and vegetation which are important food and cover for fish. Because of these problems, potential yield of fish will be much lower than predicted by the MEI for normal lakes.

There is also a problem with acidification of the waters surrounding the Montreal River. The river itself has near neutral pH, because the upper Montreal River and Cow River drain well buffered areas. However, it is suspected that most of the other inflows experience low pH levels, particularly at spring snow melt. This may be resulting in poor reproduction of walleye and pike which spawn in these tributaries. There is also concern about the river being used to move log booms. The resulting siltation and bark deposits on the bottom may smother food organisms, consume oxygen, and destroy spawning substrate. Habitat degradation from shoreline development may also occur at some locations on the system. There may also be some natural deficiencies in habitat in some locations, for example, lack of cover. However, these other habitat problems are thought to be much less important than drawdowns in limiting the fishery. The only other habitat related problem is that large portions of the reservoirs are too deep and steep to be good habitat for walleye and pike.

Exploitation is thought to have a minor impact on the fishery. However, even light fishing pressure could further depress the fishery when populations are low and productivity is poor.

A large portion of the potential yield of the Montreal River system is in under-used species such as whitefish and perch. These species could be used to provide higher catches, if pressure can be diverted to them. These under-used species may also be competing with or predating on sportfish, but these potential limitations are thought to be much less important than water drawdowns.

A conflict exists between water power and fisheries on the system, and one is perceived between log drives and fisheries. Conflict between resident anglers and tourists is minor.

Fisheries Management Actions

1. **Assessment**

   - angler survey - volunteer survey with local residents and tourist operators to assess the quality of the fishery.

   - capture study - assess population size and structure, reproduction, recruitment, and habitat use for all species.

   - habitat survey - to evaluate spawning, nursery, and adult habitat - in relation to water drawdowns.

2. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M, ACR). Guidelines for logging, road construction, mining, and other development near water will continue to be applied.

- information - educate users of the system and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for protecting fish habitat.

- water levels - optimize water levels for power and fish production.

- improve spawning areas - clean or improve substrate in existing spawning areas or create new spawning areas, taking into account water fluctuations and acidification. Experimentally neutralize a spawning area. Possible group projects.

- improve nursery and adult habitat - add cover or stabilize water levels in bays. Structures, rafts, trees and vegetation could be used for cover. Possible group projects.

- reduce acidification - encourage other agencies (MOE, Federal Government) to reduce acid emissions.

- reduce siltation and other deposition - phase out log drives and move logs by road. Stabilize log landings and eroding banks to prevent siltation of food production or spawning areas.

3. **Fish community management**

- stocking - of walleye fry may provide additional recruitment, but only if spawning is limiting and cannot be increased. Possible group project.

- introductions - the Upper and Gartshore Reservoirs may be suitable for a deep spawning or river spawning stock of lake trout.

- reduce competition and predation - reducing under-used species such as suckers and burbot may improve sportfish survival. Increasing the numbers of large sportfish may also reduce these other species. Possible group project.

4. **Harvest management**

- standard Provincial regulations - are the basis for harvest management on the system. A review of the Provincial walleye regulations may occur in the future. Most regulations will remain the same until this review is complete.

- special lake-specific regulations - a slot size limit similar to Dog Lake could be implemented to protect the first spawning year class of walleye to increase numbers and size of fish. This could be considered if results from Dog Lake are successful.

- sanctuaries - to protect spawning concentrations of walleye at Cow River, Upper Montreal River, Indian River, and Jeff Creek from 15 March to 15 June.

- information - keep users informed to gain support for management. Provide information on limited fisheries productivity, purpose of the fishery regulations, and implementation and results of regulations.

- enforcement - schedule 1% of fisheries field enforcement in the District on the system to ensure compliance with regulations. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

5. **Use management**

- catch and release - encourage the voluntary release of fish to be caught again, and inform anglers about proper release techniques.

- redirect pressure to other species - inform anglers how to catch and prepare whitefish and perch to increase angling opportunities.

- redirect pressure to other areas - improve nearby fisheries to increase angling opportunities. Establish brook trout and walleye fisheries nearby (see Zones 3 and 4).

- cottage and tourist development - any development on Crown land will consider status of fishery and other users.

- enhance tourist services - encourage operators to improve their services and facilities to obtain more revenue with less dependance on the fish resource. American plan meal systems, facilities (such as screened porches, fireplaces, saunas, and lounges) and other activities (such as wildlife viewing, hiking, sightseeing, photography, painting, etc.) increase tourism value and may reduce fish harvest.

ZONE 5H. LOWER MICHIPICOTEN RIVER

The Michipicoten River drains most of the northeast quarter of Wawa District, and is the largest river in the District. The lower portion of the river runs 16 km from the Scott Falls dam west to Lake Superior about 8 km southwest of Wawa. Most boat access is from the public launch at Michipicoten Mission; smaller boats are launched at Highway 17 and at Scott Falls. Shore anglers access the river at the above locations, the mouth, and by several trails.

The Michipicoten is one of the best spawning rivers on Lake Superior. In the spring, a moderate run of rainbow trout occurs, and a spring run of chinook salmon has recently developed. In late summer, large runs of pink salmon occur in odd years, with smaller runs in even years. In the fall, a large run of chinook salmon occurs, as well as small runs of coho salmon and rainbow trout. Smaller numbers of lake trout, brown trout, brook trout, walleye, pike, sturgeon, smallmouth bass, whitefish, and carp are also found in the river. Sea lamprey also use the river to spawn. In 1987 an estimated 100,000 pink salmon came up the river. However, there are no other estimates of the number of fish using the river or the potential yield of the river.

Angling pressure on the river is about 2500 angler-days, or about 1% of the District fishing pressure. Present harvest on the river is estimated at about 1700 kg in even years and 2700 kg in odd years, or 1 to 2% of the District sportfish harvest. A much larger harvest of rainbow trout and chinook salmon occur in Michipicoten Bay before they enter the river to spawn. Fish size is moderate to large but catch rates are low in the river, 0.09 rainbow trout/hour and less than 0.05 pink or chinook salmon/hour. Catch rates of pink salmon on dip net permits were moderate (0.62 fish/hour). Scott Falls and the spawning areas for about 2 km downstream from the dam are also among the best areas for viewing fish in the District.

Developments near the river include: Michipicoten Mission (population 300) and associated highway businesses, a marina, Michipicoten Post Provincial Park, the Township dump, some logging and mining activity, some private camps, and the hydro station at Scott Falls. Flows on the river are manipulated from about 550 to 2600 cfs for power generation. A guide service is developing on the river, and the 5 charter boats operating on Michipicoten Bay also fish the river occasionally. Future developments include a power station at Fenlons Lagoon and an expanded marina at the Mission. The river is also a fall staging area for bald eagles, which feed on the dead salmon.

Objectives

The objectives for fisheries management on the lower river are to optimize the production of river spawning stocks for Lake Superior, harvest the major sportfish species (rainbow trout, chinook and pink salmon) at close to their natural maximum sustainable yield, and increase angling quality (catch rates and species type) and fish viewing opportunities for local residents and tourists.

The specific objectives for the Michipicoten River are to:

- determine the optimum combination of substrate, depth, and flow to optimize the production of fish and water power from the river.

- determine the natural maximum sustainable yield of the major species (rainbow trout, chinook and pink salmon) and harvest these species near that level, including the harvest in Michipicoten Bay.

- increase the rainbow trout catch from 0.09 to 0.15 fish caught/hour for rainbow trout anglers.

- increase the chinook and pink salmon catch rates from less than 0.05 to 0.10 fish caught/hour for species specific anglers.

- re-establish a viable walleye population in the river.

- establish a fish viewing and interpretive area.

Problems

One of the main problems on the Michipicoten is the lack of estimates of potential and actual productivity and yield. Therefore, it is difficult to assess possible limiting factors.

The effect of angling harvest on fish stocks is not clear. Harvest is not thought to be a major limiting factor on pink salmon. However, for chinook salmon, rainbow trout, and other species, the harvest of adults both in Lake Superior and the river may reduce the production of young fish and the size of future stocks. This implies that spawning, nursery, juvenile, or adult habitat are not yet limiting. Some anglers believe that heavy harvests in the past have reduced the rainbow trout population in the river. Also, the chinook salmon stock appears to fluctuate, but it is not clear what role harvesting plays in determining the population level. More information is needed.

Habitat may be important in limiting fish production in the river. Water fluctuations can reduce fish production by dewatering spawning, nursery, juvenile and adult habitat and by reducing aquatic invertebrates and vegetation which serve as food and cover for fish. There may also be some natural limitations in the habitat. For example, there may not be enough spawning area for the number of returning fish; or there may not be enough juvenile habitat. Habitat or other factors may also limit the fish after they reach Lake Superior. It is very important to determine where the limitation is occurring, because efforts to improve production in the river will not be successful if the population is actually limited in Lake Superior.

Many of the species compete with and predate on each other in the river and in Lake Superior. For example, pink salmon may limit more desirable species by competing with them for food. Re-establishment of walleye may have a similar effect. Again the relative importance of these interactions is unknown. Sea lamprey also affect the fish populations in the river through predation in Lake Superior.

The major user conflict on the Michipicoten River is between hydro-power and fish production. Some conflict also exists between anglers and land owners along the river over trespass and litter.

Fisheries Management Actions

1. Assessment

- angler survey - to assess quality of fishery, every 1 to 3 years until fishery stabilizes.

- population study - to assess population size reproduction, and recruitment of chinook salmon and rainbow trout.

- habitat survey - evaluate spawning, nursery, and adult habitat, for main species - especially in relation to water fluctuations.

2. Harvest management

- standard Provincial regulations - are the basis for harvest management on the river. Many of the regulations on the river have just been reviewed as part of the Lake Superior fisheries management program, and the changes are outlined below. Because of the importance of the Michipicoten, other special regulations have also been proposed to improve the fisheries on the river. Other regulations will remain the same.

- special Lake Superior/Michipicoten River regulations are proposed to protect and improve the following stocks:

  walleye - catch limit 3, closed season from April 15 to June 30.

  rainbow trout - catch limit of 2, closed season Nov 15 to May 5.

  chinook salmon - no changes are proposed at present. However, pressure on this fishery is expected to increase substantially, and additional harvest controls may be needed if stocks decline.

  pink salmon - separate limit of 5 and maintain dipnetting program to help increase harvest of this species.

  sturgeon - minimum size limit of 114 cm (45 inches).

- information - to gain support for management, inform river users about limited fisheries productivity, purpose of regulations, and implementation and results of regulations.

- enforcement - schedule 3% of District fishery field enforcement on the river to ensure compliance with regulations. More time can be scheduled if violation rate is high. Encourage prompt violation reporting by emphasizing anonymous information.

3. Habitat management

- regulate development - protect fish habitat by using existing legislation and policies, and working with other agencies that deal with water quality or land use (MOE, MND&M, Township of Michipicoten, GLP). In particular, seepage from the Township dump should be monitored. Guidelines for logging, mining, road construction, and other development will continue to be applied.

- information - educate users of the river and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for protection of habitat.

- water levels - optimize water levels for power and fish production.

- spawning areas - clean or improve spawning substrate and prevent siltation by stabilizing eroding banks. Experimentally adjust bed to maintain water over prime spawning areas and eliminate marginal areas subject to dewatering. Possible group project.

- nursery and adult habitat - add cover such as structures, rocks, trees, vegetation, or depth. Experimentally provide new nursery or adult areas by creating pools and quiet water areas. Possible group projects.

4. **Fish community management**

- stocking - if recruitment is limited. Rainbow trout are stocked under a CFIP project with the Michipicoten Rod and Gun Club. Stocking could also be used to re-establish walleye in the river. Possible group project. Along with stocking, harvest and habitat management must be conducted to increase natural production. Stocking of chinook salmon is not feasible based on the size of the population now using the river.

- lamprey control - work with Canada Dept. of Fisheries and Oceans to protect sportfish.

5. **Use management**

- catch and release - encourage voluntary release of fish to be caught again, and inform anglers of proper release techniques.

- redirect pressure to under-used species - provide information on catching pink salmon to increase angling opportunities.

- angling and viewing areas - with the local agencies and interested groups - improve existing access and viewing areas at the river, and create a new access and viewing area at the island below Scott Falls. The Township is already improving the Mission marina.

ZONE 6. LAKE SUPERIOR

Lake Superior, with a surface area of 82,103 km^2, is the largest lake in the world and the largest lake trout ecosystem in the world. It is also the coldest and cleanest of the Great Lakes. The lake is managed jointly by the United States and Canada through the Great Lakes Fisheries Commission. The MNR Wawa District is responsible for managing 9,521 km or about 33% of the Ontario portion of the lake. This area runs from Montreal River north and west to the Pic River.

The Wawa District portion of Lake Superior has a large variety of fish species including: lake, rainbow, brook (coasters), and brown trout; pink, coho, and chinook salmon; lake and round whitefish; lake herring and chub; sucker; burbot; deepwater sculpin; smelt; alewife; lake sturgeon; carp; walleye; yellow perch; northern pike; and sea lamprey. Moderate to large spawning runs of rainbow trout, pink salmon, chinook salmon, suckers, and smelt occur in many streams. Smaller runs of the other trout and salmon species, sturgeon, walleye, and sea lamprey occur in some streams. In the past, the District also had river spawning stocks of lake trout and many other varieties of lake trout were recognized. On average, over 150,000 lake trout are stocked annually in the Wawa District portion of the lake. The potential yield of all species in the Wawa District portion of the lake is estimated at 364,091 kg at present. This potential yield may increase as fish stocks are rehabilitated.

There are 32 commercial fishing licences operating in the Wawa District portion of the lake. The commercial harvest is estimated at about 207,475 kg and concentrates on lake trout and to a lesser extent on whitefish, herring, chub and smelt. Lake trout are presently being harvested above their allocation, but whitefish, herring, and chub are being harvested below their allocations (Table 3). The commercial fishery is controlled using a quota system, where each fisherman has a quota for each species in each zone that he fishes. Commercial fishing is not permitted within 1000 m of any river or stream, or within Michpicoten Bay and an enlarged area at Montreal River. Catch rates and age structures of the catch indicate that lake trout stocks have not yet recovered to desired levels. Whitefish and herring stocks are also below desired levels in some areas. Chub stocks are apparently being harvested below their capacity.

Angling on the lake is concentrated on lake trout, rainbow trout, and chinook salmon. Angling pressure on the Wawa District portion of the lake is estimated at 10,000 angler-days, or 5% of the angling pressure in the District. Present angling harvest is estimated at 26000 kg, or 18% of the angling harvest in the District. Fish size is moderate to large, but catch rates are considered moderate to low - lake trout catch rates have varied from 0.27 to 0.07 fish kept/hour and chinook salmon catch rates are about 0.08 to 0.14 fish caught/hour for species anglers on Michipicoten Bay. Most angling occurs at Michipicoten Bay and Montreal River with lower amounts at Michipicoten Island, Dog (University) River, Old Woman Bay, Gargantua, Agawa Bay, and the White River. Angling pressure is increasing on Michipicoten Bay, and catch rates are decreasing. There are about 8 charter boat operators on the Wawa District portion of the lake. Some native subsistence fishing also occurs on the lake. The tributaries to Lake Superior are among the best areas for viewing fish in the District.

Wawa and Michipicoten Mission and Harbour (population 4600) and Montreal River (population 30) are the only communities along the Wawa District portion of the lake. Both areas have access to the lake which is used by commercial and sport fishermen, and charter boat operators. There is also some use from Marathon and Heron Bay. Most of the shoreline south of Wawa is in Lake Superior Provincial Park and Michipicoten Post Provincial Park. Boat access in LSPP exists at Sinclair Cove and for smaller boats at Old Woman Bay, Gargantua Harbour, Coldwater River, Katherine Cove, Sand River, and Agawa Bay. Just under half of the shoreline west of Wawa is in Pukaskwa National Park with some access for boats at the Pic River and at Hattie Cove. Other developments along Lake Superior and its tributaries include: 3 lodges; 2 commercial campgrounds; Michipicoten Island Provincial Park; coastal trails; 2 campgrounds in Lake Superior Provincial Park; 1 campground in Pukaskwa National Park; logging, mining exploration and development; and residential, commercial, and industrial development in the Michipicoten and Montreal River areas, including hydro dams at both areas and a shipping port at Michipicoten Harbour.

Fisheries management on the lake is based on the Lake Superior Strategic Fisheries Plan which sets out objectives, targets, and general strategies for managing the Canadian waters of the lake.

Objectives and Targets

Broad Objective - to protect, rehabilitate, enhance and maintain the lake's fish communities and their environment to provide an optimum contribution of fish, fishing opportunities, and associated benefits.

Broad Target - to allow an annual harvest of 364,091 kg of fish from the Wawa District waters of Lake Superior by the year 2000.

Environmental Objective - to provide an environment in the lake which can support self maintaining populations of desired and healthy fish.

Environmental Target - to achieve no net loss of the productive capacity of pristine fisheries habitats to the year 2000; and to restore habitats that have suffered damage and to increase, if possible, the productive capacity of these habitats to achieve a net gain for selected Lake Superior fisheries by the year 2000.

Lake Trout Objective - to provide for the maintenance, protection and enhancement of lake trout populations and to provide recreational angling opportunities and commercial harvest for this species based on an optimum sustainable yield.

Lake Trout Target - to provide a total annual harvest of 155,000 kg of lake trout by the year 2000 of which 105,000 kg will be commercial fish and 50,000 kg will be sport fish.

Sport Fish Objective - to meet the demand for sport fishing consistent with the limits of an optimum sustained yield.

Sport Fish Target - to provide an annual harvest of 65,000 kg of top predators per year by the year 2000 at the present catch rate of 2.6 kg/angler-day. It is estimated that 50,000 kg will be lake trout and 15,000 kg will be other species - chinook, coho and pink salmon, rainbow, brown and brook trout, walleye and pike.

Commercial Fish Objective - to encourage the harvest of commercial fish when it is biologically and economically feasible.

Commercial Fish Target - to allow an annual harvest of 299,091 kg of commercial fish by the year 2000, of which 105,000 kg will be lake trout, and 194,091 kg will be other species.

Problems

Commercial harvests have influenced the populations of many species in Lake Superior. Commercial over-fishing was a major factor (with sea lamprey) in the decline of lake trout stocks in the 1950's. Present catch rates and age structures indicate that exploitation is still limiting the lake trout stocks in many parts of the lake. Heavy commercial catches have also reduced whitefish, herring, and chub numbers from their historical levels; and present harvests continue to affect these species. Commercial fishing may also have been a factor in the decline of sturgeon, walleye and brook trout stocks, and may presently be a factor in the fluctuation in smelt numbers. Establishing realistic quotas and ensuring compliance is a problem.

Angling harvests have also affected many fish stocks in the lake. Sportfishing probably contributed to the decline in lake trout, walleye, and brook trout populations in the 1950's. More recently, angling harvests are thought to have reduced rainbow trout stocks, and may be limiting or slowing the population growth of chinook and coho salmon and lake and brown trout in accessible areas. At the present rate of growth in the chinook salmon fishery, it is projected that the angling harvest may cause a decline in chinook salmon stocks in the next few years. Harvest of the top predators other than lake trout presently exceeds their estimated potential yield. Dipnetting of smelt may also be affecting fluctuations in smelt numbers. Native subsistence fishing may affect stocks in certain areas, but is thought to be less than commercial or angling harvest. More information is needed on the population dynamics of all species in the lake to determine the effects of commercial and sport harvests on the populations. One of our main difficulties in managing the lake has been that many commercial fishermen and anglers are sceptical of our analysis of the effects of harvesting on the fish stocks and dispute harvest controls (quotas, catch limits) designed to protect or improve populations.

The aquatic community in Lake Superior greatly affects fish production in the lake. A major aspect of the aquatic community is the number of exotic species introduced by the St. Lawrence Seaway and fisheries managers. The sea lamprey is perhaps the most detrimental invader. It was a major factor in the collapse of the lake trout in the 1950's, and was probably related to the declines in other species. Chemical control of the immature lamprey occurs in their major spawning rivers, and appears to have reduced lamprey predation. However, this control is very expensive, will be required in perpetuity, and can be detrimental to other species such as walleye. Smelt and alewives have also invaded the lake. Smelt in particular has become a very important forage for all of the trout and salmon species. However, it is not known to what extent these exotic species reduce the native herring and chub forage species or young sportfish through competition or predation. Most recently, a European perch-like fish called the

ruffe has been found at Duluth. This species may spread throughout the lake and affect other species. Exotic invertebrates have also invaded the lake and may reduce native species. A number of sportfish species have also been introduced to the lake and several have become established in the Wawa District portion - rainbow and brown trout, and pink, coho and chinook salmon. These fish and the native fish compete with and predate on each other. These interactions probably occur in spawning and juvenile areas in the tributatries as well as in the lake, but the actual effects are unknown. Competition and predation from less desirable species such as pink salmon, burbot, and suckers may be reducing the numbers of more desirable species. The large number of top predators presently in the lake may also be contributing to recent declines in forage species. This could result in a future decline in trout and salmon. The instability resulting from invasions, introductions, and interactions, makes it very difficult to manage the system. More information is needed on the effects of community interactions on all species.

Habitat quality is generally high in Lake Superior. Potential exists for spills of oil and other substances from shipping, and small oil spills have occurred in the past. Low levels of contaminants are found in the water and fish, and may affect reproduction and edibility of long-lived species like lake trout. This is not considered to be a serious problem yet, but careful monitoring is needed. Some natural degradation of habitat may also have occurred in places - for example, algae and silt accumulation on unused lake trout spawning shoals.

Habitat quality is of greater concern in the tributaries to the lake. Low pH of some tributaries, resulting from acid precipitation, may be affecting the reproduction of stream spawning stocks - particularly spring spawners such as walleye and rainbow trout, but also fall spawners whose young remain in the streams during the spring runoff. Effluents from municipal and industrial activities (lagoons, storm sewers, dumps, tailings ponds) contain contaminants and nutrients which may degrade habitat and effect reproduction and edibility of fish. Fluctuation in flows for water power generation can eliminate habitat, particularly for eggs, young fish, and food organisms. Other activities such as logging, mining, and road contruction can also reduce habitat quality by damaging banks, increasing siltation, and altering water quality. Developments at the calm and marshy areas of Fenlons Lagoon and Mission Bay may also affect important habitat for young salmonids and other species. There may also be some natural limitations in the tributary habitats, for example: because of substrate conditions or natural barriers, there may not be enough spawning habitat for the number of returning fish; or there may not be enough juvenile habitat for the number of fry produced. Habitat problems are thought to be less important than harvesting or fish community interactions in limiting fish production in Lake Superior. However, habitat may be limiting some species, particularly the stream spawners. Again, more information on the population dynamics of each species is needed to determine if habitat is limiting.

Commercial and sport harvesting, the introduction of exotics, other community interactions, and possibly habitat limitations have resulted in a fluctuating and unstable fish community in Lake Superior. The instability of the system can be largely attributed to the destruction of the native fish community in the lake. Reduced predation and

competition from native fish allowed large increases and subsequent declines of other fish. The invasion of lamprey and over-fishing in the 1950's resulted in a large decline in the numbers of lake trout and other native species. The reduction in top predators resulted in a large increase in forage fish (particularly smelt) in the 1960's and 1970's. Lamprey control, massive stocking of lake trout, the introduction of exotic sportfish (particularly pink, chinook, and coho salmon), commercial fishing controls, and abundant forage have resulted in an increase in top predators in the 1970's and 1980's. A decline in the size of smelt runs and herring stocks has been noticed in the 1980's. It is not clear how this decline is related to top-predator numbers or harvesting by commercial and sport fishermen. If the forage base declines, a decline in trout and salmon stocks may occur. However, commercial and sport harvests, predation on young, or habitat in tributaries could also be limiting or about to limit various top-predator species. To prevent a decline in desired forage or top-predator species and optimize the production of these species, we need to know what factors are limiting these species and how the system interacts. This information is very difficult to obtain on a complex and continually changing system like Lake Superior. This lack of stability poses problems for the commercial fishing and tourist industries that depend on a predictable fish supply for their income.

A variety of problems are related to the use of the fisheries in Lake Superior. A major factor affecting the angling fishery is the limited access to the lake, limited marina facilities (Michipicoten River), and the limited number of protected harbours. This limits the distance that anglers will travel because of the potential dangerous weather. Consequently, easily accessible areas on the lake are heavily fished and exhibiting declining catch rates, while the vast majority of the lake is lightly fished. A large amount of fish yield available to anglers, particularly lake trout is not used at present.

Angler preference also affects the fishery. Many anglers prefer salmon and other trout over lake trout, claiming that the lake trout do not taste good. However, in many areas, lake trout remains the dominant species sought, with no complaints about palatibility of the lean stocks. Because Lake Superior is deep, cold, and clear, it is primarily a lake trout lake. The vast majority of the top-predators in the lake are lake trout; a relatively small amount of the fish community is made up of other trout and salmon, although they are quite visible because they congregate in rivers and streams to spawn. Therefore, low demand for lake trout and high demand for other salmonids has important implications for anglers. Success rates for other salmonids will decline and total harvest will be low, because their relatively small stocks are easily reduced and large amounts of lake trout production cannot be converted to these other species. Preference also affects the commercial fishery. Demand is high for trout and whitefish and they are harvested at or above their capacity, and there is little potential for increased harvest given the present allocation between commercial fishermen and anglers. However, demand for chub is low and they are apparently under-used.

Finally, some conflict exists among commercial fishermen, anglers, and tourist operators over the use of the top-predators in the lake, particularly in inshore areas. Commercial fishermen would like to have an allocation of salmon and rainbow trout and a larger allocation

of lake trout. However, many anglers and tourist operators believe that commercial fishing is presently damaging trout and salmon stocks, and they want commercial fishing reduced or eliminated. Commercial fishermen also compete among themselves for the limited stocks. Some conflict also exists between the use of Lake Superior and its tributaries for fish production and activities such as power production and waste disposal.

Fisheries Management Actions

1. **Assessment**

- commercial fish surveys - monitoring of commercial catches and independant netting assessments for species and areas with perceived problems.

- angling surveys - monitor main trout and salmon angling fisheries to assess quality, every 1 to 3 years on Michipicoten Bay until fishery stabilizes and every 5 to 10 years for other areas.

- population studies - assess population size of rainbow trout, chinook and coho salmon in all tributaries, and of lake and brook trout populations in popular angling areas in the lake. Also assess population structure, reproduction, and recruitment of these species at important angling areas.

- habitat surveys - evaluate spawning, nursery, and adult habitat for the main top-predators and forage species in all tributaries and in the lake. Acid levels, water fluctuations, and obstructions will be examined on tributaries.

- contaminant monitoring - of major species to determine if fish are healthy and safe to eat.

- refuge study - establish a large no fishing refuge possibly near Pukaskwa National Park. This would be done only if needed to assess the relative impact of harvesting and natural mortality on fish stocks, and examine interactions between species.

2. **Harvest management**

- commercial fishery regulations - refine quotas to optimize fish production. For some species and some areas it may be necessary to reduce quotas to build up stocks or retain forage. Where populations are healthy, quotas may be increased. Where incidental catches are excessive, it may be necessary to close seasons or areas, or restrict gear.

- angling regulations - based on the Lake Superior Sportfish Regulation Review, the following regulations are proposed to protect and rebuild some stocks and increase the use of other stocks on Lake Superior and its tributaries to the first barrier. Most other regulations will remain the same.

  lake trout and splake - closed season from October 1 to November 30 to protect spawning period. Aggregate catch limit of 5 trout and salmon, no more than 3 lake trout, splake, or brook trout.

brook trout - existing season. Aggregate catch limit of 5 trout and salmon, no more than 3 lake trout, splake, or brook trout.

rainbow trout - no closed season on Lake Superior. To protect staging and spawning fish, closed season from November 15 to May 5 on all tributaries west of Wawa and on Michipicoten, Old Woman, Red Rock, Gargantua, Buckshot, Baldhead, Coldwater, Sand, Barrett, Agawa, Speckled Trout, and Montreal Rivers. Close all fishing on other tributaries from Michipicoten to Montreal Rivers from April 15 to June 15. Aggregate catch limit of 5 trout and salmon, no more than 2 rainbow trout in tributaries, up to 5 in Lake Superior.

chinook and coho salmon - no changes proposed at present. However, pressure on these species is expected to increase substantially, and additional harvest control may be needed if stocks decline.

pink salmon - separate limit of 5 to increase harvest of species.

walleye - closed season from 15 April to 30 June in lower Montreal, Michipicoten, and Magpie Rivers and 15 April to 3rd Saturday in May in Lake Superior, catch limit of 3 to help rebuild stocks.

sturgeon - minimum size 114 cm to protect stocks.

- information - to gain support for management, keep lake users informed about limited fisheries productivity, purpose of regulations, implementation and results of special regulations, and proper techniques for releasing fish.

- enforcement - schedule 15% of fisheries field enforcement in the District on Lake Superior and tributaries to ensure compliance with regulations by commercial and sport fishermen. More enforcement can be scheduled if violation rate is high. Encourage prompt reporting of violations by emphasizing anonymous information and toll-free phone number.

3. **Fish community management**

- stocking - to increase or re-establish populations of desired species where recruitment is limited. Extensive stocking of lake trout will continue until the population is rehabilitated. Emphasis will be placed on establishing desirable lake trout stocks such as the lean Michipicoten Island red-fins and the river spawning Dog River stock from the Mishibishu Lake chain. Rainbow trout are being stocked in the Michipicoten River under a CFIP project with the Michipicoten Rod and Gun Club to help rebuild the population there. Stocking will also be used to re-establish coaster brook trout at Gargantua and Brule harbours and walleye at Montreal and Michipicoten Rivers - possible group projects. Stocking of chinook salmon is not feasible at present because of the size of the population using the Michipicoten River and the lack of information on limiting factors. Presently, enough hatchery capacity exists to meet the projected trout and salmon stocking requirements in the Wawa portion of the lake.

- lamprey control - with Canada Dept. of Fisheries and Oceans, investigate the feasibility of a low dam to prevent the upstream

migration of spawning lamprey and other techniques to reduce the use of lampricide. Ensure that lampricide application does not impair walleye stocks, as well as trout and salmon stocks.

- stabilize fish community - maintain healthy forage and top-predator components in the lake to prevent or limit the establishment of undesirable exotic fish, such as the ruffe and alewife, and provide stable yields of desirable fish. Competition and predation from a strong native fish community can prevent or limit the establishment of exotics and maintain stability in the fish community. Rebuilding lake trout, whitefish, herring, and chub stocks, and re-establishing river run lake trout, brook trout, and walleye populations should help stabilize the fishery.

- information - to gain support for management, inform lake users about fish community ecology, importance of a strong native fish community in maintaining stability, and limitations of stocking.

4. **Habitat management**

- regulate development - protect fish habitat by using existing legislation and policies, and by working with other agencies that deal with water quality or land use (MOE, MND&M, MOT, Township of Michipicoten, industries). Guidelines for logging, mining, road construction, and other development will continue to be applied.

- information - educate users of lake and surrounding lands about fish habitat and regulations to promote habitat protection. Provide guidelines for habitat protection.

- spawning areas - clean or improve spawning substrate and prevent sedimentation of spawning areas by stabilizing eroding banks. Remove barriers to migrating fish in streams or construct fishways. Possible group projects.

- nursery and adult habitat - add cover. Structures, rocks, trees, or vegetation can be used for cover. Experimentally provide new nursery or adult habitat by excavating pools or creating quiet water areas in tributaries. Possible group projects.

- reduce contaminants - work with other agencies (MOE, Federal Government) to reduce contaminants including acid precipitation.

5. **Use management**

- direct pressure to under-used areas - investigate new access facilities and marina services to increase angler use of the lake and distribute commercial fishing pressure. Identify existing anchorages for boaters.

- direct pressure to under-used species - increase angler use of lake trout by rehabilitating high quality lean stocks, e.g. Michipicoten Island red fins and Mishibishu-Dog River stocks. This will require protection of existing breeding populations of these fish and the development of hatchery stock from these populations to supply the stocking program. Angling pressure could also be directed at pink salmon by publicizing successful angling techniques. In the commercial fishery, additional harvesting of

pink salmon, burbot, and suckers could be feasible with the development of new harvesting, processing, or marketing capability.

- reduce conflicts - commercial fishery - maintain individual quota system and move towards consolidating quotas until eventually each fisherman has an area of his own (similar to a registered trapline) to reduce conflicts with other commercial fisherman. This could be accomplished through exchange and buy-outs of quota.

- reduce conflicts - angling and commercial fishing - direct the commercial fishery off shore to increase sportfishing and tourism in favourable areas. This has been done at Michipicoten Bay and Montreal River and is proposed for the Gargantua area and the south shore of Michipicoten Island. Commercial fish quotas in these zones will not be affected. Maintain the present allocation of lake trout and coregonids to the commercial fishery and allocate the remaining lake trout, part of the pink salmon yield, and all other top-predators to the sportfishery to reduce conflicts over these species. Inform all users about the size and value of the sport and commercial fisheries to promote acceptance of both. Encourage joint projects to improve fisheries.

4.0 OPERATING SCHEDULE 1989 -1994

The following projects are proposed for the first half of the planning period. Time and funding will be allocated according to the priority shown. Not all projects will be done. Those requiring additional funding will be limited by Provincial and Regional priorities and funding availability.

PROJECT	ADDITIONAL FUNDING REQUIRED	TARGET YEAR	PRIORITY
ASSESSMENT			
Individual Area Plans			
- Wawa Local Area	NO	1989	H
- Wawa Lake	NO	1990	H
- White River Local Area	NO	1991	M
- Dubreuilville Local Area	NO	1992	M
- Missanabie Local Area	NO	1993	M
- Kabenung Lake	NO	1994	M
Angler Surveys			
- Wawa Lake and other lakes around Wawa (Year Round)	NO	1989	H
- White River local lakes: Tukanee, Caribou, Picnic, Crockers (Year Round)	NO	1990	H
- Obatanga Park, Hammer Lake (Summer)	NO	1991	H
- Kabenung-Fungus (Summer)	NO	1992	H
- Negwazu-Pokei (Summer)	YES	1993	M
- Hawk-Anjigami (Year Round)	NO	1994	M
- White (Summer)	YES	1989	M
- Oba (Summer)	YES	1990	H
- Wabatong (Summer)	YES	1991	H
- Dog (Year Round)	YES	1992	H
- Lake Superior Provincial Park including Mijin Lake (Year Round)	NO	1993	H
- Manitowik-Whitefish (Year Round)	YES	1994	M (H winter)
- Michipicoten River and Bay (Summer)	YES	1989-1993	H
- Montreal River Mouth and Reservoir (Summer)	YES	1994	M
Native Fishery Survey			
- White Lake (Summer)	YES	1989	M
Commercial Fishery Surveys			
- Lake Superior-zones and species with problems (year round)	YES	1989-1994	L
Lake and Stream Surveys			
- aerial surveys of community and road corridor area	NO	1989,1991,1993	H

- lakes for trout and walleye intros (12-15 every other year) 50% near communities 25% near road corridors 25% other	NO	1990,1992,1994	H
- important waters without productivity information (1-2 every other year)	YES	1990,1992,1994	M
Fish Population Surveys			
- Wawa Lake (lake trout)	YES	1989	H
- Michipicoten River (rainbow trout & chinook salmon)	YES	1990-1993	H
- stocked and introduced lakes (2-3 per year)	YES	1989-1994	L
Habitat Surveys			
- in conjunction with all angler and fish population surveys	YES	1989-1994	M
- Magpie River Power Project Monitoring	YES	1989-1990	M
Calculate Potential Yields			
- all lakes with tourist camps	NO	1989	H
Other Possible Projects			
- population estimates; White, Esnagi, Oba, Wabatong, Dog, Whitefish-Manitowik	YES		L
- contaminant monitoring	YES		L
- Lake Superior Fish Refuge	YES		L
HARVEST MANAGEMENT			
Special Walleye Regulations			
- Picnic, Bare Tent - Upper Lola Chain, Hawk, Rennie, Obatanga Prov. Park, White, Esnagi, Oba, Wabatong, Dog	NO	1989-1991	H
Special Lake Trout Regulations			
- Dayohessarah, Tukanee, Troupe, Blacktrout, Mijinemungshing, Dog	NO	1989-1991	H
Special Brook Trout Regulations			
- Paint, Rock, Kabinakagami Broughton Twp., Oakley, Maquon	NO	1989-1991	H
Special Pike Regulations			
- Kinniwabi	NO	1989-1991	L
Special Rainbow Trout populations			
- Lake Superior tributaries	NO	1989-1991	H
Special Lake Superior and Tributary Regulations			
- lake trout, brook trout, pink salmon, walleye, sturgeon	NO	1989-1991	M

Sanctuaries			
- White, Esnagi, Oba, Wabatong, Dog, Manitowik, Whitefish, Montreal River, Kabenung, Fungus, Knife, Shikwamkwa	NO	1989-1991	H
Refine Commercial Fish Quotas	NO	1989-1994	M
Information			
- brochure on special regulations	YES	1989-1990	M
- sign lakes with special regulations	YES	1989-1991	H
- provide information on fisheries productivity and effects of harvesting	NO	1989-1994	M
Enforcement			
- schedule enforcement in proportion to pressure	YES	1989-1994	H
- promote reporting of violations	YES	1989-1994	H
FISH COMMUNITY MANAGEMENT			
Stocking			
- maintain level of existing trout stocking inland and Lake Superior	NO	1989-1994	H
- additional trout stocking 2 lakes/year and Lake Superior	YES	1989-1994	H
- walleye stocking possibly 1 experimental lake (CFIP)	YES		L
Introductions			
- walleye 1 lake/year (MNR)	NO	1989-1994	H
1 lake/year (CFIP)	YES	1989-1994	H
- lake trout 1 lake/year (MNR)	NO	1989-1994	H
- brook trout 1 lake/year (MNR)	YES	1989-1994	H
Lake Reclamation			
- possibly 1 lake	YES		L
Coarse Fish Removal			
- possibly 2 experimental projects (CFIP)	YES		L
Live Baitfish Restriction Regulation	NO	1989-1991	H
Lamprey Barrier Feasibility Investigations	NO	1989-1991	L
Information			
- sign areas with live baitfish prohibitions	YES	1990,1991	M
- provide information on fish community ecology, and limitations of stocking and introductions	NO	1989-1994	M

HABITAT MANAGEMENT

Regulate Development			
- plan review, enforcement	NO	1989-1994	H
Information			
- brochure on habitat protection	YES	1990-1991	M
- provide information on fish habitat and protection	NO	1989-1994	M
Spawning Areas			
- 1 project every other year (MNR)	YES	1989,1991,1993	M
- possibly 1 project/year (CFIP)	YES	1989-1994	M
Nursery and Adult Habitat			
- 1 project every other year (MNR)	YES	1990,1992,1994	M
- possibly 1 project/year (CFIP)	YES	1989-1994	M
Reduce Siltation			
- possibly 1 project every other year (MNR or CFIP)	YES	1989,1991,1993	M
Reduce Acidification			
- encourage experimental management of acidified lakes	NO	1989-1994	L
Water Level Management			
- White, Esnagi, Wabatong, Dog, Whitefish-Manitowik, Michipicoten, Montreal River	NO	1989-1994	H

USE MANAGEMENT

Alternate Uses			
- provide information on catch and and release and proper release techniques	NO	1989-1994	M
- provide information on catching whitefish, perch, pink salmon	NO	1989-1994	M
- provide information on viewing fish	NO	1989-1994	M
- acquire native lean lake trout stock for planting in Lake Superior	YES	1989-1994	M
- encourage commercial fishermen to catch under-used species	NO	1989-1994	L
- diversify local fisheries with stocking and introductions	YES	1989-1994	H
Development			
- work with MOT to provide parking for lakes along highway	NO	1989-1994	L
- sign stocked lakes and other lakes near roads	YES	1989-1993	M

- manage tourist, cottage, road development and boat caches on Crown land to provide a variety of uses of fisheries, minimize conflicts, and protect fisheries	NO	1989-1994	H
- encourage tourist operators to improve facilities and services	NO	1989-1994	L
- create a salmon viewing area on the Michipicoten River at the island below Scott Falls (CFIP)	YES		M
- investigate improved access to Lake Superior and identify existing anchorages	YES	1989-1994	M
Reduce Conflict			
- provide information on value of fisheries to local residents, tourism industry, commercial fish industry and natives	NO	1989-1994	L
- encourage tourist operators to offer special packages to local residents	NO	1989-1994	L
- encourage natives to subsistence fish under-used species	NO	1989-1994	L
- encourage joint projects to improve fisheries	NO	1989-1994	M
- work towards individual licence areas for commercial fishermen	NO	1989-1994	M
- create angling only zones at Gargantua and Michipicoten Island	NO	1989	M

5.0 PUBLIC COMMENTS

The District Fisheries Management Plan has been prepared to provide information on the fisheries in the Wawa District and indicate how these fisheries will be managed. Your comments are invited, and will be considered in the 5 year review of the plan. If you would like to discuss any aspect of fisheries management, contact us at the Ministry of Natural Resources, P.O. Box 1160, Wawa, Ontario, P0S 1K0, telephone (705) 856-2396.

APPENDIX 1. WAWA DISTRICT INLAND LAKE - TROUT STOCKING LIST 1983 - 1988

LAKE	TOWNSHIP	SPECIES	1983	1984	1985	1986	1987	1988
AMYOT POTHOLE	MCGOWAN	BROOK TROUT	X*				X	X
ANDRE LAKE	CORBIERE	BROOK TROUT						X
BABY LAKE	BRIMACOMBE	BROOK TROUT		X				X
BARRY LAKE	JACOBSON	BROOK TROUT				X	X	
BORZOI LAKE	FIDDLER	BROOK TROUT	X			X	X	
BREMNER LAKE	ESQUEGA	SPLAKE			X	X	X	X
BRIDGET LAKE	RABAZO	SPLAKE						X
BUCK LAKE	CECILE	BROOK TROUT		X	X	X	X	
CARIBOU LAKE	ABRAHAM	LAKE TROUT						X
CENTENNIAL LAKE	NAVEAU	BROOK TROUT	X	X	X	X	X	X
CLEARWATER LAKE	LABERGE	RAINBOW TROUT	X		X		X	X
CLEARWATER LAKE	COMMON	BROOK TROUT	X		X		X	X
COLETTE LAKE	TIERNAN	BROOK TROUT	X	X				X
		SPLAKE		X	X	X	X	
CRESCENT LAKE	PEEVER	BROOK TROUT	X	X	X	X	X	X
CRYSTAL LAKE	ESQUEGA	RAINBOW TROUT	X	X	X		X	X
DAD LAKE	BRIMACOMBE	BROOK TROUT			X	X	X	X
DEAD LAKE	KNOWLES	BROOK TROUT		X	X	X	X	X
DICEY LAKE	MCMURRAY	BROOK TROUT	X	X	X	X	X	X
DOC GREIG LAKE	BRIMACOMBE	RAINBOW TROUT	X					
		SPLAKE				X		
		BROOK TROUT						X
DRAGLINE LAKE	CECILE	BROOK TROUT	X	X	X	X	X	X
EAST SHELL LAKE	VASILOFF	BROOK TROUT			X	X	X	X
FEARLESS LAKE	BROTHERS	LAKE TROUT			X	X	X	X
FENTON LAKE	DULHUT	SPLAKE			X			
FOG LAKE	ABRAHAM	BROOK TROUT	X					X
FRANCIS LAKE	CHABANEL	BROOK TROUT						X
HALF LAKE	COPENACE	BROOK TROUT					X	X
HENRY LAKE	LARONDE	BROOK TROUT	X		X		X	X
HILLTOP LAKE	RABAZO	LAKE TROUT		X	X	X	X	X
JERRARDS LAKE	VASILOFF	BROOK TROUT	X		X		X	X
KABOSSKWA POTHOLE	MIKANO	BROOK TROUT	X	X	X		X	
KLEIN'S POTHOLE	WELSH	BROOK TROUT	X	X				
LITTLE FLOOD LAKE	FLOOD	BROOK TROUT		X	X		X	
MACGREGOR LAKE	PEEVER	SPLAKE			X			
		BROOK TROUT						X
MANTON LAKE	ECHUM	BROOK TROUT	X	X	X		X	
MAQUON LAKE	STONE	BROOK TROUT	X	X	X	X		
MIKANO POTHOLE	MIKANO	BROOK TROUT	X	X			X	
MILDRED LAKE	CHABANEL	BROOK TROUT					X	
MILEAGE 10 POTHOLE	VASILOFF	BROOK TROUT	X		X		X	X
MINTO LAKE	MCMURRAY	BROOK TROUT	X	X	X	X	X	
MOM LAKE	BRIMACOMBE	BROOK TROUT			X			X
MUDHOLE LAKE	PEEVER	BROOK TROUT	X	X	X	X	X	X
MYSTERY LAKE	DUMAS	BROOK TROUT	X	X	X	X	X	X
NANCY LAKE	BAILLOQUET	BROOK TROUT	X	X	X	X	X	X
NORTH BUCK LAKE	CECILE	SPLAKE					X	X
NORTH O'BRIEN LAKE	ABRAHAM	BROOK TROUT	X				X	

LAKE	TOWNSHIP	SPECIES	1983	1984	1985	1986	1987	1988
NORTH OGANEK LAKE	ABRAHAM	BROOK TROUT			X		X	X
NORTH TWIN LAKE	CECILE	BROOK TROUT	X	X	X	X	X	X
NORWALK LAKE	RABAZO	BROOK TROUT	X	X	X	X	X	X
OAKLEY LAKE	MCMURRAY	BROOK TROUT	X				X	X
ORPHAN LAKE	BRIMACOMBE	BROOK TROUT			X			
PARKINSON'S POTHOLE	DAHL	BROOK TROUT	X	X	X	X	X	X
PILOTS LAKE	KNOWLES	BROOK TROUT	X			X	X	
RABBIT BLANKET LAKE	PETERSON	BROOK TROUT		X				
		SPLAKE			X	X	X	X
RAINBOW LAKE	STONEY	BROOK TROUT		X				
RED ROCK LAKE	TIERNAN	RAINBOW TROUT	X	X	X		X	
		SPLAKE				X		X
ROCK LAKE	TILSTON	BROOK TROUT	X	X	X	X	X	X
ROI LAKE	HOME	SPLAKE						X
ROOT CELLAR LAKE	ASHLEY	BROOK TROUT	X	X	X	X	X	X
SOULIERE LAKE	BRUYERE	BROOK TROUT						X
SOULOUP LAKE	DUMAS	BROOK TROUT	X	X	X	X	X	X
SOUTH O'BRIEN LAKE	VASILOFF	BROOK TROUT			X		X	
SOUTH SHELL LAKE	VASILOFF	BROOK TROUT			X		X	X
SOUTH TWIN LAKE	CECILE	BROOK TROUT	X	X	X	X	X	X
SUMMIT LAKE	BROUGHTON	BROOK TROUT						X
TUKANEE LAKE	COMMON	LAKE TROUT	X		X	X	X	X
TURTLE LAKE	FLOOD	BROOK TROUT	X				X	
UNNAMED LAKE 2-J-64	BAILLOQUET	BROOK TROUT				X	X	X
UNNAMED LAKE 2-J-68	BAILLOQUET	BROOK TROUT	X	X	X	X	X	X
UNNAMED LAKE 8-I-24	HUNT	BROOK TROUT	X	X	X	X	X	X
VIOLET LAKE	CUDNEY	BROOK TROUT	X	X	X		X	X
WAWA LAKE	MCMURRAY	LAKE TROUT	X	X	X	X	X	X
ZOLA LAKE	NOGANOSH	BROOK TROUT	X	X	X		X	

* 500 TO 3000 YEARLING FISH PLANTED